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1986

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HEALTH STATISTICS

1986

Office of the State Registrar and Center for Health Statistics

Michigan Department of Public Health
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Michigan Department of Public Health

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TABLE OF CONTENTS

INTRODUCTION 1

TECHNICAL NOTES, DEFINITIONS, RATES AND RATIOS 2

QUALIFICATIONS AND LIMITATIONS OF DATA AND CALCULATIONS 6

SECTION I - NATALITY

Natality: An Overview, 1986 11
Natality 13
Live Births 13
Fertility 15
Racial Composition 18
Age of Mother 22
Age-specific Live Birth Rates 26
Birth Order 29
Interpregnancy Time Period 33
Prenatal Care 33
Birth Weight 43
Sex of Infant 50
Mother's Education 50
Congenital Anomalies 50
Complications 57
Place of Occurrence 62
Place of Birth 63
Attendant at Birth 64
Fetal Deaths 66
Causes of Fetal Death 66
Age of Mother and Race of Fetus 71
Interpregnancy Time Period for Fetal Deaths 71
Prenatal Care - Fetal Deaths 74
Fetal Weight 79

SECTION II - MORTALITY

Mortality: An Overview, 1986 87
Mortality 89
Leading Causes of Death 102

Diseases of the Heart 117
Cancer 129
Cerebrovascular Disease 141
Accidents 152
Chronic Obstructive Pulmonary Diseases and Allied Conditions 167
Pneumonia and Influenza 175
Diabetes Mellitus 185
Atherosclerosis 195
Chronic Liver Disease and Cirrhosis 204
Suicide 214
The Probability of Eventual Death Due to a Specified Cause 223
Infant Deaths 225
Communicable Disease Deaths 247
Injury at Work 249
Life Expectancy 251
Place of Occurrence 255

SECTION III MARRIAGE AND DIVORCE

Marriage and Divorce: An Overview, 1986 259
Marriages and Divorces 261
Marriages 261
Residence of Couples Marrying in Michigan 261
Month of Marriage 264
Age at Marriage 264
Remarriages 266
First Marriages 271
Median Age at First Marriage 278
Divorces and Annulments 278

LIST OF TABLES

SECTION I - NATALITY

1.1 Total Births, Michigan Residents, Selected Years, 1900 - 1986 13

1.2 Live Births and Crude Birth Rates, Michigan and United States Residents, Selected Years, 1900 - 1986 16

1.3 Fertility Rates, Michigan and United States Residents, Selected Years, 1900 - 1986 19

1.4 Live Births by Infant's Race or National Origin, Michigan Residents, 1970 - 1986 21

1.5 Crude Birth Rates and Fertility Rates by Race, Michigan Residents, 1970 - 1986 23

1.6 Live Births and Percent Distribution by Age of Mother and Race of Child, Michigan Residents, 1986 24

1.7 Live Births and Population of Women by Age, Michigan Residents, 1976 and 1986 25

1.8 Age-Specific Live Birth Rates by Race, Michigan Residents, 1976 and 1986 27

1.9 First Births, Michigan and United States Residents, Selected Years, 1960 - 1986 31

1.10 Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1976 32

1.11 Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1986 32

1.12 Live Births to Women Reporting Prior Pregnancy Terminations by Time Span Between Last and Current Termination, Michigan Residents, 1976 and 1986 34

1.13 Live Births to Women Reporting Prior Pregnancy Terminations by Time Span Between Last and Current Termination and by Whether Prior Termination Resulted in a Live Birth or a Non-live Birth, Michigan Residents, 1986 36

1.14 Live Births by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1986 37

1.15 Numbers and Percents of Live Births with Prenatal Care Beginning in the First Trimester by Age of Mother and Race of Child, Michigan Residents, 1986 38

1.16 Live Births by Month of Pregnancy Prenatal Care Began and Live Birth Order, Michigan Residents, 1986 39

1.17 Live Births and Percent Distribution by Number of the Mother's Prenatal Visits and Race of Child, Michigan Residents, 1986 40

1.18 Live Births with No Prenatal Care by Age of Mother and Race of Child, Michigan Residents, 1986 41

1.19 Number and Percent of Live Births by Level of Prenatal Care and Race of Child, Michigan Residents, 1986 42

1.20 Live Births by Birth Weight and Race, Michigan Residents, 1986 44

1.21 Low Weight Live Births and Low Birth Weight Ratios by Age of Mother and Race of Child, Michigan Residents, 1986 45

1.22 Low Weight Live Births and Low Birth Weight Ratios by Number of Prenatal Visits and Race of Child, Michigan Residents, 1986 46

1.23 Low Weight Live Births and Low Birth Weight Ratios by Level of Prenatal Care and Race of Child, Michigan Residents, 1986 48

1.24 Live Births, Low Weight Live Births, and Low Birth Weight Ratios, by Sex and Race, Michigan Residents, 1986 51

1.25 Live Births by Age and Education of Mother, Michigan Residents, 1986 52

1.26 First Birth Ratios by Age and Education of Mother, Michigan Residents, 1986 53

1.27 Congenital Anomalies Reported by Type of Anomaly, Michigan Residents, 1986 54

1.28 Live Births with Congenital Anomalies Reported and Congenital Anomaly Rates by Age of Mother and Race of Child, Michigan Residents, 1986 55

1.29 Live Births with Specific Types of Complications Reported, Michigan Residents, 1986 58

1.30 Live Births with Complications Reported and Complication Rates by Age of Mother and Race of Child, Michigan Residents, 1986 61

1.31 Michigan Resident Live Births Occurring Outside of Michigan by Place of Occurrence, and Live Births Occurring in Michigan to Non-Michigan Residents by Place of Residence, 1986 62

1.32 Live Births by Place of Delivery, Michigan Occurrences, 1975 - 1986 . . . 63

1.33 Live Births by Place of Delivery and Type of Attendant, Michigan Occurrences, 1986 65

1.34 Fetal Deaths and Fetal Death Ratios, Michigan and United States Residents, 1900 - 1986 69

1.35 Fetal Deaths and Fetal Death Ratios by Underlying Cause of Death, Michigan Residents, 1986 70

1.36 Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Age of Mother and Race of Fetus, Michigan Residents, 1986 72

1.37 Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Interpregnancy Time Span, Michigan Residents Reporting Prior Pregnancy Terminations, 1986 73

1.38 Fetal Deaths to Women Reporting Prior Pregnancy Terminations by Time Span Between Last and Current Termination and by Whether Prior Termination Resulted in a Live Birth or a Fetal Death, Michigan Residents, 1986 74

1.39 Fetal Deaths and Percent Distribution by Number of Mother's Prenatal Visits and Race of Fetus, Michigan Residents, 1986 75

1.40 Fetal Deaths, Total Births and Fetal Death Rates by Number of Prenatal Visits and Race, Michigan Residents, 1986 77

1.41 Fetal Deaths by Gestational Age and Number of Prenatal Visits, Michigan Residents, 1986 79

1.42 Fetal Deaths by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1986 80

1.43 Fetal Deaths, Total Births and Fetal Death Rates by Level of Prenatal Care and Race, Michigan Residents, 1986 81

1.44 Number and Percent of Fetal Deaths by Level of the Mother's Prenatal Care and Race of Fetus, Michigan Residents, 1986 82

1.45 Fetal Deaths by Fetal Weight and Plurality, Michigan Residents, 1986 83

1.46 Fetal Deaths by Fetal Weight and Gestational Age, Michigan Residents, 1986 84

SECTION II - MORTALITY

2.1 Number of Deaths and Crude Death Rates, Michigan and United States Residents, 1970 - 1986 89

2.2 Deaths by Age, Sex, and Marital Status, Michigan Residents, 1986 92

2.3 Number of Deaths by Race, Michigan Residents, 1970 - 1986 93

2.4 Number of Deaths by Age, Race, and Sex, Michigan Residents, 1986 95

2.5 Death Rates by Age, Race, and Sex, Michigan Residents, 1986 96

2.6 Age-Adjusted Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 101

2.7 Leading Causes of Death and Cause-Specific Rates, Michigan and United States Residents, 1986 103

2.8 Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 107

2.9 Deaths Due to Diseases of the Heart by Age, Race, and Sex, Michigan Residents, 1986 118

2.10 Heart Disease Death Rates by Age, Race, and Sex, Michigan Residents, 1986 119

2.11 Age-Adjusted Heart Disease Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 125

2.12 Deaths Due to Diseases of the Heart by Specific Cause, Michigan Residents, 1986 126

2.13 Deaths Due to Cancer by Age, Race, and Sex, Michigan Residents, 1986 130

2.14 Cancer Death Rates by Age, Race, and Sex, Michigan Residents, 1986 . . 131

2.15 Age-Adjusted Cancer Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 137

2.16 Deaths Due to Malignant Neoplasms by Site Affected, Michigan Residents, 1986 138

2.17 Deaths Due to Cerebrovascular Disease by Age, Race, and Sex, Michigan Residents, 1986 142

2.18 Cerebrovascular Disease Death Rates by Age, Race, and Sex, Michigan Residents, 1986 144

2.19 Age-Adjusted Cerebrovascular Disease Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 149

2.20 Deaths Due to Cerebrovascular Diseases by Specific Cause, Michigan Residents, 1986 150

2.21 Deaths Due to Accidents by Age, Race, and Sex, Michigan Residents, 1986 153

2.22 Accident Death Rates by Age, Race, and Sex, Michigan Residents, 1986 . 154

2.23 Age-Adjusted Accident Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 160

2.24 Deaths Due to Accidents by Type of Accident, Michigan Residents, 1986 161

2.25 Deaths Due to Accidents by Age at Death and Type of Accident, Michigan Residents, 1986 162

2.26 Deaths from Motor Vehicle Accidents by Person Injured and Age at Death, Michigan Residents, 1986 163

2.27 Deaths Due to Accidents by Place of Injury, Michigan Residents, 1986 . 164

2.28 Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race, and Sex, Michigan Residents, 1986 168

2.29 Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race, and Sex, Michigan Residents, 1986 169

2.30 Age-Adjusted Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Race and Sex, Michigan Residents, 1970 - 1986 and United States Residents, 1979 - 1986 172

2.31 Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Specific Cause, Michigan Residents, 1986 173

2.32 Deaths Due to Pneumonia and Influenza by Age, Race, and Sex, Michigan Residents, 1986 176

2.23 Pneumonia and Influenza Death Rates by Age, Race, and Sex, Michigan Residents, 1986 177

2.34 Age-Adjusted Pneumonia and Influenza Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 181

2.35 Deaths Due to Pneumonia and Influenza by Specific Cause, Michigan Residents, 1986 182

2.36 Deaths Due to Diabetes Mellitus by Age, Race, and Sex, Michigan Residents, 1986 186

2.37 Diabetes Mellitus Death Rates by Age, Race, and Sex, Michigan Residents, 1986 187

2.38 Age-Adjusted Diabetes Mellitus Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 191

2.39 Deaths Due to Diabetes Mellitus by Detailed Cause, Michigan Residents, 1986 193

2.40 Deaths Due to Atherosclerosis by Age, Race, and Sex, Michigan Residents, 1986 196

2.41 Atherosclerosis Death Rates by Age, Race, and Sex, Michigan Residents, 1986 197

2.42 Age-Adjusted Atherosclerosis Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 201

2.43 Deaths Due to Atherosclerosis by Detailed Cause, Michigan Residents, 1986 202

2.44 Deaths Due to Chronic Liver Disease and Cirrhosis by Age, Race, and Sex, Michigan Residents, 1986 205

2.45 Death Rates for Deaths Due to Chronic Liver Disease and Cirrhosis, by Age, Race, and Sex, Michigan Residents, 1986 206

2.46 Age-Adjusted Death Rates for Deaths Due to Chronic Liver Disease and Cirrhosis by Race and Sex, Michigan and United States Residents, 1970 - 1986 210

2.47 Deaths Due to Chronic Liver Disease by Detailed Cause, Michigan Residents, 1986 211

2.48 Deaths Due to Suicide by Age, Race, and Sex, Michigan Residents, 1986 215

2.49 Suicide Death Rates by Age, Race, and Sex, Michigan Residents, 1986 . . 216

2.50 Age-Adjusted Suicide Death Rates by Race and Sex, Michigan and United States Residents, 1970 - 1986 220

2.51 Deaths Due to Suicide by Method, Michigan Residents, 1986 221

2.52 Infant Deaths and Infant Mortality Rates, Michigan and United States Residents, 1970 - 1986 225

2.53 Infant Deaths and Mortality Rates by Age at Death, Michigan Residents, 1976 - 1986 228

2.54 Infant Deaths by Age at Death and Underlying Cause, Michigan Residents, 1986 231

2.55 Infant Deaths and Infant Death Rates by Race of Infant and Underlying Cause, Michigan Residents, 1986 232

2.56 Infant Deaths and Infant Death Rates by Sex of Infant and Underlying Cause, Michigan Residents, 1986 234

2.57 Infant Deaths, Live Births, and Infant Death Rates by Race, Michigan Resident Infants Born in 1985 235

2.58 Hebdomadal Deaths and Death Rates by Race, Michigan Resident Infants Born in 1985 235

2.59 Infant Deaths, Live Births, and Infant Death Rates by Age of Mother and Race of Infant, Michigan Resident Infants Born in 1985 236

2.60 Infant Deaths, Live Births, and Infant Death Rates by Prenatal Visits and Race of Infant, Michigan Resident Infants Born in 1985 237

2.61 Infant Deaths, Live Births, and Infant Death Rates by Level of Prenatal Care and Race of Infant, Michigan Resident Infants Born in 1985 239

2.62 Perinatal Deaths, Total Births, and Perinatal Death Rates by Age of Mother and Race of Infant or Fetus, Births to Michigan Residents in 1985 241

2.63 Perinatal Deaths, Total Births, and Perinatal Death Rates by Prenatal Visits and Race of Infant or Fetus, Births to Michigan Residents in 1985 242

2.64 Perinatal Deaths, Total Births, and Perinatal Death Rates by Level of Prenatal Care and Race of Infant, Births to Michigan Residents in 1985 . 243

2.65 Infant Deaths by Birth Weight and Mother's Age, Michigan Resident Infants Born in 1985 244

2.66 Live Births by Birth Weight and Race of Infant and Infant Deaths and Infant Death Rates by Birth Weight, Age at Death, and Race of Infant, Michigan Resident Infants Born in 1985 245

2.67 Deaths From Selected Infectious and Parasitic Diseases, Michigan Residents, 1986 247

2.68 Deaths Due to Infectious and Parasitic Diseases by Age, Race, and Sex, Michigan Residents, 1986 248

2.69 Infectious and Parasitic Diseases Death Rates by Age, Race, and Sex, Michigan Residents, 1986 248

2.70 Deaths Due to Injury at Work by Place of Injury, Michigan Residents, 1986 249

2.71 Deaths Due to Injury at Work by Cause of Death, Michigan Residents, 1986 250

2.72 Life Expectancy at Birth by Sex, Michigan and United States Residents, Selected Years, 1901 - 1986 252

2.73 Life Expectancy at Birth by Sex and Race, Michigan Residents, Selected Years, 1950 - 1986 253

2.74 Michigan Resident Deaths Occurring Outside Michigan by Place of Occurrence and Deaths Occurring in Michigan to Non-Michigan Residents by Place of Residence, 1986 255

SECTION III - MARRIAGES AND DIVORCES

3.1 Marriages and Marriage Rates, Michigan and United States Occurrences, Selected Years, 1920 - 1986 263

3.2 Marriages by Residence Status of Bride and Groom, Michigan Occurrences, 1976 and 1986 264

3.3 Place of Residence of Non-Resident Brides and Grooms, Marriages Occurring in Michigan, 1986 265

3.4 Marriages by Month, Michigan Occurrences, 1986 265

3.5 Number of Marriages and Marriage Rates by Age and Sex, Michigan Occurences, 1976 and 1986 266

3.6 Marriages by Age of Bride and Age of Groom, Michigan Occurrences, 1986 267

3.7 Age at First Marriage and Remarriage: Bride, Michigan Occurrences, 1976 and 1986 268

3.8 Age at First Marriage and Remarriage: Groom, Michigan Occurrences, 1976 and 1986 269

3.9 Remarriages of Brides by Age and Order of Marriage, Michigan Occurrences, 1976 and 1986 272

3.10 Remarriages of Grooms by Age and Order of Marriage, Michigan Occurrences, 1976 and 1986 273

3.11 First Marriages by Age of Bride, Michigan Occurrences, 1976 - 1986 . . . 274

3.12 First Marriages by Age of Groom, Michigan Occurrences, 1976 - 1986 . . 275

3.13 First Marriage Rates by Age of Bride, Michigan Occurrences, 1976 - 1986 276

3.14 First Marriage Rates by Age of Groom, Michigan Occurrences, 1976 - 1986 277

3.15 Number of Divorces and Annulments, and Divorce and Annulment Rates, Michigan and United States Occurrences, Selected Years, 1920 - 1986 280

3.16 Divorces and Annulments by Children Under 18 Present, Michigan Occurrences, 1976 and 1986 281

3.17 Estimated Number of Children Involved in Divorces and Annulments, Average Number of Children Per Decree, and Rate Per 1,000 Children Under 18 Years of Age, Michigan and the United States, Selected Years, 1960 - 1986 283

3.18 Divorces and Annulments by Age of Husband and Wife at Time of Decree, Michigan Occurrences, 1986 284

3.19 Divorces and Annulments by Duration of Marriage at Time of Separation and at Time of Dissolution, Michigan Occurrences, 1986 . . . 285

SECTION IV - REFERENCE APPENDIX

4.1 Population, Live Births, Deaths (All Ages, Infant, Neonatal, Postneonatal, Perinatal, Fetal, and Maternal), Marriages and Divorces, Michigan 1900 - 1986 290

4.2 Live Birth Rates, Death Rates (All Ages, Infant, Neonatal, Postneonatal, Perinatal, and Maternal), Fetal Death Ratios, Marriage and Divorce Rates, Michigan, 1900 - 1986 292

4.3 Number of Live Births by Age of Mother, Michigan Residents, 1920 - 1986 294

4.4 Live Birth Rates by Age of Mother, Michigan Residents, 1920 - 1986 . . 296

4.5 Reported Cases of Certain Communicable Diseases, Michigan Residents, 1900 - 1986 298

4.6 Case Rates of Certain Reported Communicable Diseases, Michigan Residents, 1900 - 1986 300

4.7 Number of Deaths and Death Rates for Certain Communicable Diseases, Michigan Residents, 1900 - 1986 302

4.8 Number of Deaths and Death Rates by Specified Causes, Michigan Residents, 1900 - 1986 304

4.9 Selected Vital Statistics by County, Michigan Residents, 1986 306

4.10 Selected Vital Statistics Rates by County, Michigan Residents, 1986 . . . 308

4.11 Live Births with Selected Risk Factors by County of Residence, Michigan Residents, 1986 310

4.12 Live Births by Age of Mother and County of Residence, Michigan Residents, 1986 312

4.13 Vital Statistics for Residents of Selected Michigan Cities, 1986 315

4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986 316

4.15 Reported Cases of Certain Communicable Diseases by County, Michigan Residents, 1986 322

4.16 Number of Deaths by Cause, Michigan Residents, 1986 324

4.17 Population Changes by County, Michigan, 1976 and 1986 334

4.18 Population by Age, Race, and Sex, Michigan Residents, 1986 336

4.19 Abridged Life Table, Michigan Residents, 1986 337

4.20 Abridged Life Table for Males, Michigan Residents, 1986 337

4.21 Abridged Life Table for Females, Michigan Residents, 1986 338

4.22 Abridged Life Table for Whites, Michigan Residents, 1986 338

4.23 Abridged Life Table for White Males, Michigan Residents, 1986 339

4.24 Abridged Life Table for White Females, Michigan Residents, 1986 . . . 339

4.25 Abridged Life Table for Blacks, Michigan Residents, 1986 340

4.26 Abridged Life Table for Black Males, Michigan Residents, 1986 340

4.27 Abridged Life Table for Black Females, Michigan Residents, 1986 341

LIST OF FIGURES

SECTION I - NATALITY

1.1 Live Births, Michigan Residents, 1900 - 1986 14

1.2 Live Birth Rates, Michigan Residents, 1900 - 1986 and United States Residents, 1909 - 1986 17

1.3 Total Fertility Rates, Michigan and United States Residents, 1920 - 1986 . 20

1.4 Age-Specific Live Birth Rates, Michigan Residents, 1970 - 1986 28

1.5 First Births as a Percentage of All Live Births, Michigan and United States Residents, 1960 - 1986 30

1.6 Percent of Women Having Live Births Who Received Care Prior to the 4th Month and 6th Month of Prengancy, Michigan Residents, 1970 - 1986 35

1.7 Low Birth Weight Ratio, Michigan and United States Residents, 1960 - 1986 49

1.8 Incidence of Congenital Anomalies Reported Per 10,000 Live Births, Michigan Residents, 1960 - 1986 56

1.9 Fetal Deaths, Michigan Residents, 1900 - 1986 67

1.10 Fetal Death Ratios, Michigan Residents, 1900 - 1986, and United States Residents, 1922 - 1985 68

1.11 Percent of Women Having Fetal Deaths Who Received Care Prior to the 4th Month and the 6th Month of Pregnancy, Michigan Residents, 1970 - 1986 78

SECTION II - MORTALITY

2.1 Crude Death Rates, Michigan and United States Residents, 1900 - 1986 . 91

2.2 Age-Specific Death Rates by Sex, Michigan Residents, 1986 97

2.3 Age-Specific Death Rates by Race, Michigan Resident Males, 1986 99

2.4 Age-Specific Death Rates by Race, Michigan Resident Females, 1986 . . . 100

2.5 Leading Causes of Death, Michigan Residents, 1986 104

2.6 Age-Specific Heart Disease Death Rates by Sex, Michigan Residents, 1986 120

2.7 Age-Specific Heart Disease Death Rates by Race, Michigan Resident Males, 1986 121

2.8 Age-Specific Heart Disease Death Rates by Race, Michigan Resident Females, 1986 122

2.9 Heart Disease Death Rates, Michigan and United States Residents, 1900 - 1986 124

2.10 Probability of Eventually Dying From Heart Disease by Age and Sex, Michigan Residents, 1984 - 1986 128

2.11 Age-Specific Cancer Death Rates by Sex, Michigan Residents, 1986 132

2.12 Age-Specific Cancer Death Rates by Race, Michigan Resident Males, 1986 133

2.13 Age-Specific Cancer Death Rates by Race, Michigan Resident Females, 1986 134

2.14 Cancer Death Rates, Michigan and United States Residents, 1900 - 1986 . 135

2.15 Probability of Eventually Dying From Cancer by Age and Sex, Michigan Residents, 1984 - 1986 140

2.16 Age-Specific Cerebrovascular Disease Death Rates by Sex, Michigan Residents, 1986 143

2.17 Age-Specific Cerebrovascular Disease Death Rates by Race, Michigan Resident Males, 1986 145

2.18 Age-Specific Cerebrovascular Disease Death Rates by Race, Michigan Resident Females, 1986 146

2.19 Cerebrovascular Disease Death Rates, Michigan and United States Residents, 1900 - 1986 147

2.20 Probability of Eventually Dying From Cerebrovascular Disease by Age and Sex, Michigan Residents, 1984 - 1986 151

2.21 Age-Specific Accident Death Rates by Sex, Michigan Residents, 1986 . . 155

2.22 Age-Specific Accident Death Rates by Race, Michigan Resident Males, 1986 156

2.23 Age-Specific Accident Death Rates by Race, Michigan Resident Females, 1986 157

2.24 Accident Death Rates, Michigan and United States Residents, 1900 - 1986 159

2.25 Probability of Eventually Dying From Accidental Causes by Age and Sex, Michigan Residents, 1984 - 1986 165

2.26 Age-Specific Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Sex, Michigan Residents, 1986 170

2.27 Age-Specific Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Race, Michigan Residents, 1986 171

2.28 Probability of Eventually Dying From Chronic Obstructive Pulmonary Diseases and Allied Conditions, by Age and Sex, Michigan Residents, 1984 - 1986 174

2.29 Age-Specific Pneumonia and Influenza Death Rates by Sex, Michigan Residents, 1986 178

2.30 Age-Specific Pneumonia and Influenza Death Rates by Race, Michigan Residents, 1986 179

2.31 Pneumonia and Influenza Death Rates, Michigan and United States Residents, 1900 - 1986 180

2.32 Probability of Eventually Dying From Pneumonia and Influenza by Age and Sex, Michigan Residents, 1984 - 1986 184

2.33 Age-Specific Diabetes Mellitus Death Rates by Sex, Michigan Residents, 1986 188

2.34 Age-Specific Diabetes Mellitus Death Rates by Race, Michigan Residents, 1986 189

2.35 Diabetes Mellitus Death Rates, Michigan and United States Residents, 1900 - 1986 190

2.36 Probability of Eventually Dying From Diabetes Mellitus by Age and Sex, Michigan Residents, 1984 - 1986 194

2.37 Age-Specific Atherosclerosis Death Rates by Sex, Michigan Residents, 1986 198

2.38 Age-Specific Atherosclerosis Death Rates by Race, Michigan Residents, 1986 199

2.39 Atherosclerosis Death Rates, Michigan and United States Residents, 1900 - 1986 200

2.40 Probability of Eventually Dying From Atherosclerosis by Age and Sex, Michigan Residents, 1984 - 1986 203

2.41 Age-Specific Chronic Liver Disease and Cirrhosis Death Rates by Sex, Michigan Residents, 1986 207

2.42 Age-Specific Chronic Liver Disease and Cirrhosis Death Rates by Race, Michigan Residents, 1986 208

2.43 Chronic Liver Disease and Cirrhosis Death Rates, Michigan and United States Residents, 1900 - 1986 209

2.44 Probability of Eventually Dying From Chronic Liver Disease and Cirrhosis by Age and Sex, Michigan Residents, 1984 - 1986 213

2.45 Age-Specific Suicide Death Rates by Sex, Michigan Residents, 1986 . . . 217

2.46 Age-Specific Suicide Death Rates by Race, Michigan Residents, 1986 . . 218

2.47 Suicide Death Rates, Michigan and United States Residents, 1900 - 1986 219

2.48 Probability of Eventually Dying From Suicide by Age and Sex, Michigan Residents, 1984 - 1986 222

2.49 Infant Mortality Rates, Michigan Residents, 1900 - 1986 and United States Residents, 1915 - 1986 227

2.50 Infant Death Rates by Race, Michigan Residents, 1970 - 1986 229

2.51 Remaining Years of Life by Age, Sex, and Race, Michigan Residents, 1986 254

SECTION III - MARRIAGES AND DIVORCES

3.1 Marriage Rates, Michigan and United States Occurrences, 1900 - 1986 . 262

3.2 Percent of All Marriages That Are Remarriages, Michigan Occurrences, 1960 - 1986 270

3.3 Median Age at First Marriage by Sex, Michigan Occurrences, 1953 - 1986 279

3.4 Divorce Rates, Michigan and United States Occurrences, 1900 - 1986 . . 282

SECTION IV - REFERENCE APPENDIX

4.1 Rate of Natural Increase, Michigan, 1906 - 1986, and the United States, 1909 - 1986 289

4.2 Total Population, Percent Under Age 20 and Percent Age 65 and Over by Region, Michigan, 1986 314

4.3 Michigan Live Birth Certificate 342

4.4 Michigan Fetal Death Certificate 343

4.5 Michigan Death Certificate 344

4.6 Michigan Marriage License 345

4.7 Michigan Divorce Record 346

INTRODUCTION

The 1986 edition of Michigan Health Statistics is a statistical summary of vital events for calendar year 1986. Data relative to population, births, deaths, fetal deaths, marriages, divorces and communicable diseases are included. Although most of the data in this report pertain to events occurring in 1986, data for prior years have been included to illustrate trends. Most of the tabulations refer to Michigan residents. Some events, however, such as marriages and divorces are tabulated with respect to where the event occurred rather than the residence of the party or parties involved.

As a certain number of Michigan residents either deliver babies or die out of state each year, it is necessary to include data obtained from the certificates of other states in any tabulations pertaining to Michigan residents. This report includes all such out-of-state certificates received prior to April 30, 1987, and all in-state certificates and records received prior to March 15, 1987. Records from a few Michigan counties and institutions which were filed after March 15, 1987 were also include. Although a few additional records for the calendar year 1986 were received after these filing dates, their exclusion from this report is statistically insignificant.

This report is composed of the following sections and appendices:

1. Natality Section
2. Mortality Section
3. Marriage and Divorce Section
4. Reference Appendix

Comments or suggestions concerning the content and format of this report are always welcome. Any additional needs for data or analyses may be directed to the Office. A summary of prepared vital statistics tabulations, Index to Michigan Vital Statistics 1960 to Present, is also available. This index lists the types of tabulations and data available. The Office will make every attempt to comply with requests for data within the limitations of staff and resources.

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TECHNICAL NOTES, DEFINITIONS, RATES AND RATIOS

DEFINITIONS

BIRTH WEIGHT - Weight of fetus or infant at time of delivery.

FETAL DEATH - Death prior to the complete expulsion or extraction from its mother of a product of conception, having passed through at least the 20th week of gestation or weighing at least 400 grams; the fetus shows no signs of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. (Note: This includes both spontaneous and induced terminations.)

FIRST BIRTH - A live birth where the maternal medical history indicates there were no prior live births to the mother.

GESTATIONAL PERIOD - Number of completed weeks elapsed between the first day of the last menstrual period and the date of delivery.

HEBDOMADAL DEATH - Death occurring to an individual less than 7 days of age.

INFANT DEATH - Death occurring to an individual less than 1 year of age.

INTERPREGNANCY TIME PERIOD - Birth date minus date of last termination, whether a live birth or fetal death, in months. Time periods of zero length are dropped to exclude 2nd or higher births of multiple deliveries.

LEADING CAUSES OF DEATH - Deaths are grouped into 72 categories dependent upon the underlying cause of death. Ranks are assigned by organizing these categories according to the number of deaths in each category from most frequent to least.

LIFE EXPECTANCY - A hypothetical calculation of the average age at death for a cohort of persons subject to the age-specific mortality rates observed over a given time period.

LIFE TABLE VALUES:

nqx = The proportion of persons in the cohort alive at the beginning of an age interval (x) who will die before reaching the end of that age interval (x+n).

lx = The number of persons living at the beginning of an age interval (x) out of an original cohort of 100,000.

ndx = The number of persons who would die during an age interval (x to x+n) out of an original cohort of 100,000.

nLx = The number of person-years that would be lived within an indicated age interval (x to x+n) out of an original cohort of 100,000 alive for all or part of the interval.

Tx = The number of person-years that would be lived after the beginning of an age interval (x) by an original cohort of 100,000 until all are assumed to have died.

ex = The average remaining lifetime (in years) for an individual person who survives to the beginning of an indicated age interval (x).

LIVE BIRTH - A live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Effective on November 9, 1981, the definition of a live birth is established in administrative rule number 325.3201 as follows:

> *"Live birth"* means the complete expulsion or extraction from a pregnant woman of a product of human conception which, after such expulsion or extraction, shows any evidence of life, whether or not the umbilical cord has been cut or the placenta is attached.

LIVE-BIRTH ORDER - Order number is equal to number of previous live births plus current birth.

LOW-WEIGHT BIRTH - Birth in 1984 or later wherein the birth weight is less than 2,500 grams (approximately 5 lbs., 8 oz.) or birth before 1984 wherein the birth weight is 2,500 grams or less.

MATERNAL DEATHS - Those deaths wherein the physician has designated a maternal condition as the underlying cause of death (9th Revision ICD codes 630-676).

MEAN - The average of a set of values, equal to the sum of the values divided by the number of values.

MEDIAN - The central value of a distribution of values wherein the same percentage of observations are above this point as are below.

MINOR CIVIL DIVISION - City, village, or township.

NEONATAL DEATH - Death occurring to individual less than 28 days of age.

OCCURRENCE - Place where the event actually occurred.

PERINATAL DEATH - Fetal death or death under 1 week of age.

PROBABILITY OF EVENTUALLY DYING FROM A GIVEN CAUSE OF DEATH - The chance of death due to a given cause rather than some competitive cause over the course of a lifetime based on current mortality data and life expectancy techniques.

RACE - Race for mother, father, or decedent is as stated on certificate. Race of child is determined from the race of the parents.

REMAINING YEARS OF LIFE - A hypothetical calculation of the average number of years a cohort of persons will live given that they have reached a specific age and assuming they are subject to the age-specific mortality rates observed over a given time period.

RESIDENCE - Usual place of residence for the person to whom the event occurred. For births and fetal deaths residence is defined as the mother's usual place of residence.

TOTAL BIRTHS - Live births and fetal deaths.

UNDERLYING CAUSE OF DEATH - That condition giving rise to the chain of events leading to death.

RATES AND RATIOS

AGE-ADJUSTED DEATH RATE - A summary rate of death that is developed using a standard population distribution to improve the comparability of rates for areas or population subgroups with differing age distributions. When calculated by the direct method, as in this report, age-specific death rates for a geographic area or population subgroup are multiplied by the standard population by specific age and the products summed and divided by the total standard population. Age-adjusted death rates represent the mortality experience that would have occurred in a standard population had the age-specific rates of the area or population subgroup been experienced by the standard population. These rates are presented as per 100,000 population.

AGE-SPECIFIC BIRTH RATE - Number of resident live births to women of a specific age divided by total resident female population of specific age x 1,000.

AGE-SPECIFIC DEATH RATE - Number of resident deaths in specific age group divided by total resident population in specific age group x 100,000.

AGE-SPECIFIC DEATH RATE BY CAUSE OF DEATH - Number of resident deaths in specific age group and from a specific cause divided by total resident population in specific age group x 100,000.

AGE-SPECIFIC MARRIAGE RATE - Numberof occurrent marriages in specific age group by sex divided by total resident population in specific age and sex group x 1,000.

CAUSE-SPECIFIC RATE - Number of resident deaths due to a specific cause divided by total resident population x 100,000.

CONGENITAL ANOMALY RATE - Number of resident live births with a congenital malformation reported divided by the total number of resident live births x 10,000.

COMMUNICABLE DISEASE CASE RATE - Number of reported cases (of specific communicable diseases) divided by total resident population x 100,000.

CRUDE BIRTH RATE - Number of resident live births divided by total resident population x 1,000.

CRUDE DEATH RATE - Number of resident deaths divided by total resident population x 1,000.

DIVORCE RATE - Number of persons (with occurrent divorces and annulments) divided by total resident population x 1,000.

FERTILITY RATE - Number of resident live births divided by total resident female population (ages 15-44) x 1,000.

FETAL DEATH RATE - Number of resident fetal deaths divided by total resident live births and resident fetal deaths x 1,000.

FETAL DEATH RATIO - Number of resident fetal deaths divided by total resident live births x 1,000.

FIRST MARRIAGE RATE - Number of occurrent marriages to persons not previously married by sex divided by total resident population by sex x 1,000.

INFANT MORTALITY RATE - Number of resident infant deaths divided by total resident live births x 1,000.

LOW-WEIGHT BIRTH RATIO - Number of resident low-weight births divided by total resident live births x 1,000.

MARRIAGE RATE - Number of resident persons married in an area divided by total resident population x 1,000.

MATERNAL DEATH RATE - Number of resident maternal deaths divided by total resident live births x 10,000.

NEONATAL DEATH RATE - Number of resident neonatal deaths divided by total resident live births x 1,000.

NO PRENATAL CARE RATIO - Number of resident live births to mothers with no prenatal care divided by total resident live births x 1,000.

PERINATAL DEATH RATE - Number of perinatal deaths divided by total resident live births and resident fetal deaths x 1,000.

RATE OF NATURAL INCREASE - (Total resident live births minus total resident deaths) divided by total resident population x 1,000.

TOTAL FERTILITY RATE - Sum of (age-specific birth rates) x (number of years in age group) for each age group from ages 10-14 through 45-49 years.

RELIABILITY OF RATES

Care should be taken in drawing specific inferences from comparisons of rates for different areas or different periods of time. Rates based on a small number of events or for a small area tend to exhibit considerable variation from time period to time period or place to place. Excessive variation in rates not only negates their utility as estimators of the probability of an event occurring but also their usefulness for comparative purposes.

Also, one should recognize the limitations of using unadjusted rates in attempting to attribute rate differences to particular factors. For example, one should not attempt to state that there was a significant difference in rates for two geographic areas for atherosclerosis without first adjusting the rates to negate the effects of differing age distributions in the two areas.

Many times there are simply not sufficient data available to adequately adjust rates for all possible confounding factors. For this reason the reader should exercise diligence and caution while attempting to draw substantive conclusions when comparing vital statistics rates.

QUALIFICATIONS AND LIMITATIONS OF DATA AND CALCULATIONS

UNDERREGISTRATION OF EVENTS

The underregistration of vital events in Michigan is considered to be a minimal problem, particularly for births and deaths. Tests of registration completeness conducted in conjunction with the 1950 Census indicate that the registration of births was 98.5 percent complete, and that death registration was even more complete. The number of certificates received too late for inclusion in annual statistical files is insignificant when examining statewide patterns.

GEOGRAPHIC ALLOCATION

The allocation of events on a residence or occurrence basis is for the most part accurate and complete. However, allocations to minor civil divisions are subject to question in some instances. In those cases where the respondent completes the residence item with a mailing address, geographic allocation is sometimes undeterminable and the record receives an unknown minor civil division code.

FETAL DEATHS

Fetal deaths in Michigan include only those conceptions that have passed through 20 weeks gestation or that weigh 400 grams or more. Prior to the introduction of a new reporting form for fetal deaths on September 30, 1978, Michigan law required only the reporting of deaths of fetuses which had passed through 20 weeks gestation. Inadequacies in determining the gestational age of the fetus may have resulted in some underreporting of fetal deaths. The change in definition has had little impact on the number of fetal deaths reported.

COMPARABILITY IN CAUSE OF DEATH STATISTICS

The reader should bear in mind two major limitations in interpreting changes in cause-of-death statistics. Changes in nomenclature and the classification scheme (International Classification of Diseases) and changes in diagnostic practices may seriously affect the comparability of such statistics over time. The classification scheme (ICD) is modified approximately once every ten years to reflect changing medical opinion and practice. The reader is most accurate when comparing cause-of-death certificates which are coded via one revision of the International Classification of Diseases and utilizing the coding practices and procedures in effect at that time.

In order to compare cause-of-death statistics from one revision to the next it is necessary to apply a comparability ratio. Such ratios are developed by comparing the number of deaths assigned to a certain condition or group of conditions under one revision to the number assigned under another revision of the ICD.

In 1979 the 9th Revision of the International Classification of Diseases, WHO, was introduced for coding causes of death and was employed in categorizing the data for 1986.

LIFE EXPECTANCY

The procedure used to obtain the Michigan life table values is called the iterative method. This is a method which has been developed by Felix Moore, formerly of the Department of Biostatistics, School of Public Health, University of Michigan.

For the age group 0-1 the method utilizes the algorithm developed by Greville with no iteration. For all subsequent age groups the method of Greville (Keyfitz) is used with three iterations to improve the estimate of ndx and nqx. An iteration procedure is also used for nLx for age groups 75-80 and 80-85 where the accuracy of mortality information is a factor and for obtaining the separation factor for the age group 1-4.

AGE-ADJUSTMENT PROCEDURE AND POPULATION ESTIMATION

Population data for 1970 and 1980 were obtained from the April 1, 1970 and April 1, 1980 census counts. Data for 1980 include revised census data as released by the Census Bureau. The population totals used for 1971-1979 are intercensal estimates prepared by the Census Bureau utilizing the revised 1980 census figures. The breakdowns of these totals by age, race, and sex were prepared by the Office of the State Registrar and Center for Health Statistics. For 1970 and 1980 the proportion of the total population in each age, race, and sex group was computed. Estimates of the proportion of the total population in each age, race, and sex group for the years 1971-1979 were then derived by interpolating between the proportions for 1970 and 1980. These subgroup proportions were then applied to the state totals to obtain population estimates by age, race, and sex for years 1971-1979.

Population estimates for 1985 and 1986 by age and sex were obtained by adding births removing deaths and aging the remaining population, using Census Bureau-National Cancer Institute 1984 age, race, and sex population estimates. Black and other race estimates for 1985 and 1986 were prepared by projecting the mean annual change in the race proportions of each age-sex group of the nonwhite population observed between 1970 and 1980. Revised estimates of the proportion of the total population in each age, race and sex group for the years 1981-1983 were derived by interpolating between the populations for 1980 and 1984.

The age-adjusted rates for Michigan presented in this report for years 1970-1986 were calculated using Michigan resident mortality data and the series of population data described above. Death records with the race not stated were first randomly allocated to the white and other than white groups based on the proportion of Michigan resident deaths in each of the racial categories for that year. Records with sex not stated were randomly assigned to male and female (50 percent each). Records with age not stated were allocated to the age group 85 and over.

In the age-adjustment procedure ten age groups were employed including under 1 year, 1-14 years, ten year age groups from 15-24 years to age 75-84, and 85 years and over. Age-specific rates for the total population and for each subgroup were applied to the same standard population distributed by age. The resulting expected deaths were then summed over the ten age groups and divided by the total of the standard population to obtain the age-adjusted rate. The standard population selected was the 1940 United States enumerated population. Comparisons can be made between subgroup rates, between rates in different years, and between rates for Michigan and similarly computed rates for the United States.

UNITED STATES DEATH RATES

Death rates for the United States were taken from publications by the National Center for Health Statistics, U.S. Department of Health and Human Services. Rates for the United States shown in the series of tables of age-adjusted death rates for Michigan and the United States are based on the 1980 census enumeration. The U.S. rates for 1971-1980 have been revised as a result of the large difference between the 1980 census enumeration and the previously estimated population for 1980. The 1980 census enumeration was about 5.5 million higher than the estimated population for April 1, 1980.

The unadjusted death rates for the United States for all causes and by cause for 1981 through 1986 quoted in the text and shown in Tables 2.1 and 2.7 were calculated using population estimates based on the 1980 census enumeration.

NATALITY

SECTION I

NATALITY: AN OVERVIEW, 1986

TOTAL RESIDENT BIRTHS	138,491
TOTAL RESIDENT LIVE BIRTHS	137,626
RESIDENT LIVE BIRTHS PER DAY	377.1
TOTAL RESIDENT FETAL DEATHS	865
RESIDENT FETAL DEATHS PER DAY	2.4
CRUDE BIRTH RATE	15.1
FERTILITY RATE	63.2
FETAL DEATH RATIO	6.3
FIRST ORDER BIRTHS (PERCENT OF TOTAL LIVE BIRTHS)	40.4
MEDIAN BIRTH WEIGHT IN GRAMS (LIVE BIRTHS)	3,402
MEDIAN BIRTH WEIGHT IN GRAMS (FETAL DEATHS)	1,106
LOW WEIGHT LIVE BIRTHS	9,537
LOW WEIGHT BIRTH RATIO	69.3
MEDIAN AGE OF MOTHER (LIVE BIRTHS)	26
MEDIAN AGE OF MOTHER (FETAL DEATHS)	26
LIVE BIRTHS WITH CONGENITAL ANOMALIES	875
CONGENITAL ANOMALIES PER 10,000 LIVE BIRTHS	63.6
LIVE BIRTHS WITH NO PRENATAL CARE	1,195
NO PRENATAL CARE RATIO	8.7
HOME BIRTHS	733
LIVE BORN SETS OF TWINS	1,505
LIVE BORN SETS OF TRIPLETS	23
LIVE BORN MULTIPLE BIRTHS OF FOUR OR MORE	1
MALE LIVE BIRTHS PER 100 FEMALE LIVE BIRTHS	105.4

NATALITY

Between 1900 and 1986 the number of total births (live births and fetal deaths) has varied considerably. The general trend has been increasing numbers of total births from 1900 through 1957, declining numbers through 1976 and fairly stable numbers since that time.

According to the annual enumeration of births by local officials in 1900 there were 45,024 births in Michigan. This figure dropped slightly to 44,722 in 1901 (the lowest total in the century). The number of reported births increased significantly with the initiation in 1906 of mandatory filing of individual certificates for each Michigan birth. Total births increased during the next two decades, dropped temporarily in 1919, and then leveled off at just over 100,000 between 1924 and 1930.

During the first years of the Great Depression, total births declined from 102,596 in 1930 to 83,258 in 1933. Then from 1933 to 1957, excluding the war years of 1944 and 1945, total births increased to a century high peak of 211,642 in 1957. Births in the next two decades dropped to a post-World War II low of 132,642 in 1976. Since 1976, the number of total births increased, reaching 146,297 in 1980, declined to 133,959 in 1983 and increased to 138,491 in 1986 (Table 1.1).

Table 1.1
Total Births[1], Michigan Residents,
Selected Years, 1900 - 1986[2]

YEAR	TOTAL BIRTHS
1900	45,024
1901	44,722
1910	66,668
1920	96,015
1930	102,596
1933	83,258
1940	101,708
1950	163,150
1957	211,642
1960	198,064
1970	173,727
1971	164,167
1972	148,624
1973	143,232
1974	138,852
1975	135,287
1976	132,642
1977	139,700
1978	140,003
1979	145,627
1980	146,297
1981	141,619
1982	138,904
1983	133,959
1984	136,711
1985	139,005
1986	138,491

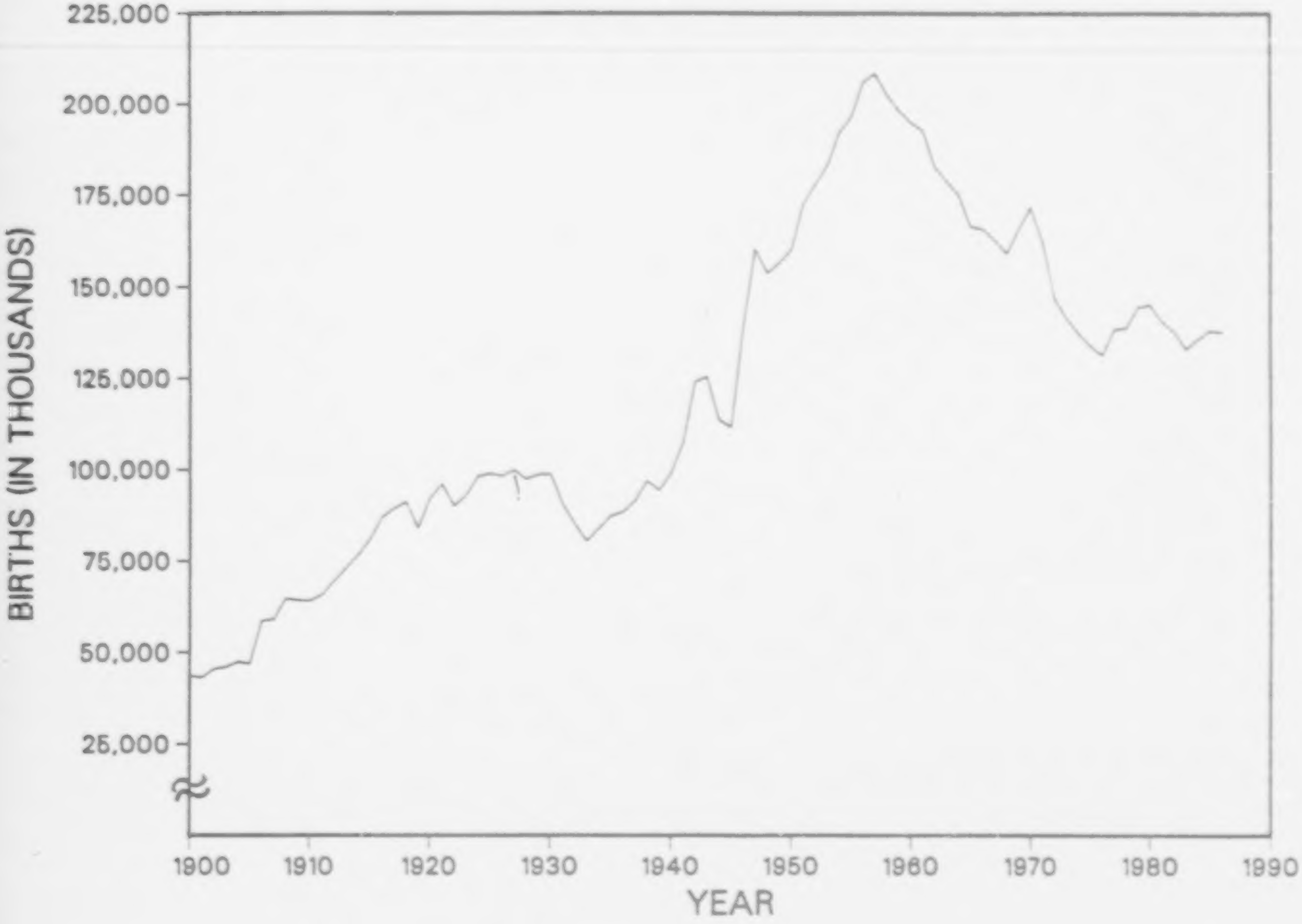
[1] Live births plus fetal deaths.

[2] Total births for 1982 - 1985 include fetal deaths previously unreported.

LIVE BIRTHS

The smallest number of live births officially recorded in this century was 43,221 in 1901. The actual number of live births was undoubtedly higher. Because of the method of recording, many live births were probably not recorded. Figure 1.1 portrays the number of live births for Michigan from 1900 through 1986.

FIGURE 1.1
LIVE BIRTHS, MICHIGAN RESIDENTS, 1900-1986



Live births, which constitute a large percentage of total births, naturally followed the same pattern of increases and decreases, rising appreciably from 43,699 in 1900 to 208,488 in 1957, the peak year for this century (Figure 1.1 and Table 1.2). Between 1957 and 1976, live births decreased by 37 percent to 131,378, the lowest total in 31 years. In 1977, however, live births increased by 5.4 percent, the largest such increase since 1951. In each of the following three years the number of live births also increased. In 1980 there were 145,162 live births, the highest annual total since 1972. Between 1980 and 1983 the number of live births declined by 8.4 percent, reaching 133,026 in 1983. By 1986 the number of live births increased 3.5 percent to 137,626.

The national pattern was similar to that observed in Michigan. Live births increased from an estimated 2,718,000 in 1909 to an estimated 4,300,000 in 1957. Since 1957, there has been a general decline in live births. The low point occurred in 1973 when live births in the United States totaled 3,136,965. Unlike Michigan, the number of live births for the nation increased in nine out of eleven years from 1976 through 1986. For 1986 the provisional figure was 3,731,000 a slight decrease (0.8 percent) from the number born in 1985.

Another view of the historic pattern in live births may be obtained through examination of changes in the crude birth rate. By considering population size the historic pattern of live births is stabilized (Figure 1.2). The crude birth rate in Michigan ranges from a low of 14.4 per 1,000 residents in 1976 to a high of 27.4 in 1956. The crude birth rate increased from 22.1 in 1906, the first year for filing birth certificates, to 26.2 in 1916. During the period 1917 to 1933 Michigan's crude birth rate declined steadily, reaching 16.2. The birth rate rose over the next 23 years to a peak in 1956 (27.4). Between 1956 and 1976 Michigan's crude birth rate declined by 47 percent, falling to 14.4. Since 1976, the crude birth rate has fluctuated between a high of 15.7 in 1980 and a low of 14.5 in 1983. In 1986 the rate was 15.1.

National statistics since 1900 follow the same general pattern of rising and falling as observed in Michigan. The highest rate observed nationally over the period 1909 through 1986 was 30.1 in 1910, while the lowest was 14.6, occurring in both 1975 and 1976. United States live birth rates were above those observed in Michigan without exception from 1909 to 1941. Between 1942 and 1947, national rates were above those for the state twice. National birth rates were below Michigan rates from 1949 through 1975. For ten of the past eleven years, the rates for the nation were equal to or above those observed in Michigan. The 1986 provisional rate for the United States was 15.5 per 1,000 people.

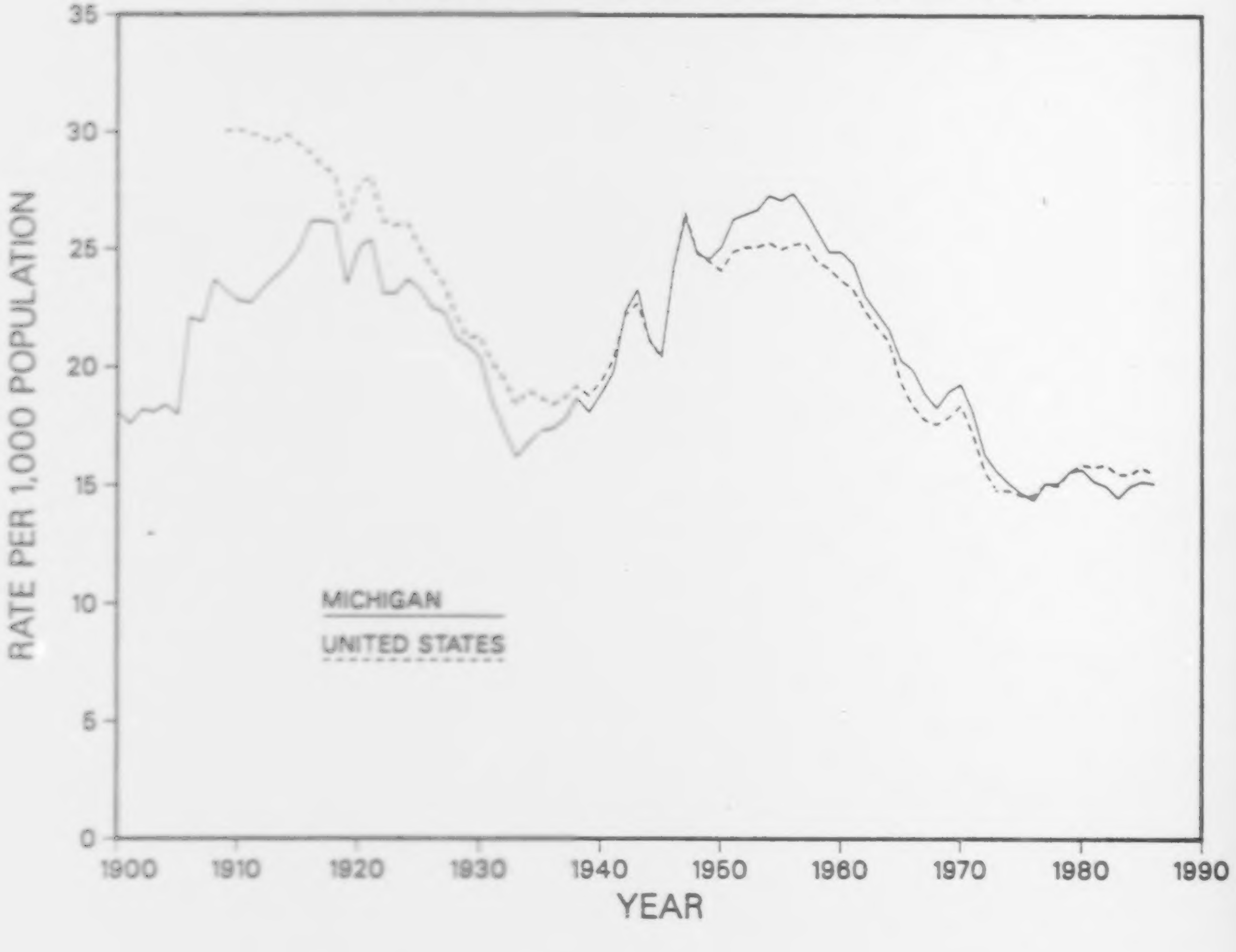
FERTILITY

The crude birth rates examined above are useful statistics for gauging overall trends in live births for specific geographic areas. Where attempts are made to interpret such trends, however, crude birth rates can be misleading. These rates do not specifically incorporate the size of the population capable of bearing children. This population subset, generally considered to be women between the ages of 15 through 44, does not always maintain a stable relationship with the total population. A more exact measure for analyzing changing birth patterns is the fertility rate. Since the fertility rate relates the number of live births

Table 1.2
Live Births and Crude Birth Rates, Michigan and United States Residents, Selected Years, 1900-1986

UNITED STATES		YEAR	MICHIGAN	
LIVE BIRTHS	RATE		LIVE BIRTHS	RATE
---	---	1900	43,699	18.1
2,777,000	30.1	1910	64,109	22.8
2,950,000	27.7	1920	92,245	25.1
2,618,000	21.3	1930	98,882	20.4
2,559,000	19.4	1940	99,106	18.9
3,632,000	24.1	1950	160,055	25.1
4,257,850	23.7	1960	195,056	24.9
4,268,326	23.3	1961	192,825	24.4
4,167,362	22.4	1962	182,790	23.0
4,098,020	21.7	1963	178,871	22.3
4,027,490	21.1	1964	175,103	21.6
3,760,358	19.4	1965	166,464	20.3
3,606,274	18.4	1966	165,794	19.9
3,520,959	17.8	1967	162,756	18.9
3,501,564	17.6	1968	159,058	18.3
3,600,206	17.9	1969	165,760	19.0
3,731,386	18.4	1970	171,667	19.3
3,555,970	17.2	1971	162,244	18.1
3,258,411	15.6	1972	146,854	16.3
3,136,965	14.8	1973	141,550	15.6
3,159,958	14.8	1974	137,414	15.1
3,144,198	14.6	1975	133,931	14.7
3,167,788	14.6	1976	131,378	14.4
3,326,632	15.1	1977	138,416	15.1
3,333,279	15.0	1978	138,802	15.1
3,494,398	15.6	1979	144,452	15.6
3,612,258	15.9	1980	145,162	15.7
3,629,238	15.8	1981	140,579	15.2
3,680,537	15.9	1982	137,950	15.0
3,638,933	15.5	1983	133,026	14.5
3,669,141	15.5	1984	135,782	15.0
3,760,561	15.8	1985	138,052	15.2
3,731,000Pr.	15.5Pr.	1986	137,626	15.1

FIGURE 1.2
LIVE BIRTH RATES, MICHIGAN RESIDENTS, 1900-1986 AND UNITED STATES RESIDENTS,[1] 1909-1986



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[1] 1-United States Rates prior to 1909 are not available.

to the female population of childbearing age, more valid comparisons for various periods of time and locations are possible.

A comparison of fertility rates for Michigan with those for the United States is presented in Table 1.3. The crude birth rate changes observed understate the recent decline in fecundity for both regions. Since 1960 the crude birth rate in Michigan has dropped 39.4 percent, while the fertility rate in 1986 was 48.7 percent below the 1960 rate. For the United States over this same period the crude birth rate declined 34.6 percent and the fertility rate fell by 45.0 percent. The difference in these two measures occurs because the proportion of the population in the childbearing ages has increased over this 26 year period.

Figure 1.3 displays the changes in the total fertility rate between 1920 and 1986 for Michigan and the United States. (See also Table 4.4) The total fertility rate is a hypothetical measure of the number of live births that would occur to each 1,000 women during their reproductive life, if these women experienced the age-specific birth rates observed in a given year.

Michigan's total fertility rate has generally paralleled that of the nation. The Michigan rate dropped from 3,195.5 in 1920 to 2,006.5 in 1933 and then increased between 1933 and 1957, reaching 4,100.0 in the latter year. Between 1957 and 1976 the total fertility rate in Michigan declined to a low of 1,709.5 in 1976. The rates for the following ten years were higher, fluctuating between a high of 1,817.5 in 1981 and a low of 1,738.0 in 1984. In 1986 the rate was 1,776.5. The rate was 1,842.5 in 1985 for the United States. The national rates were higher than the Michigan rates each year between 1975 and 1985, except 1981.

Since 1973 both Michigan and national total fertility rates have been below 2,000. A total fertility rate of over 2,000 is necessary for replacement of the parents, since not all women survive the reproductive years nor do all children survive to adulthood. If the total fertility rate falls below 2,000 for a long period, a natural decrease in population will eventually result. It should be noted that although the total fertility rate has been below 2,000 since 1973, the rate of natural increase for Michigan remains positive. Over the period 1973 through 1986, there were 868,538 persons added to the population of Michigan through the excess of live births over deaths.

RACIAL COMPOSITION

The racial composition of live births in Michigan changed over the period 1970 through 1986 (Table 1.4). Live births of white persons declined from 83.8 percent of all live births in 1970 to 81.2 percent in 1973. Between 1974 and 1985, this percentage held between 81.3 and 82.5. In 1986, the percentage droped to a new low of 80.7 percent.

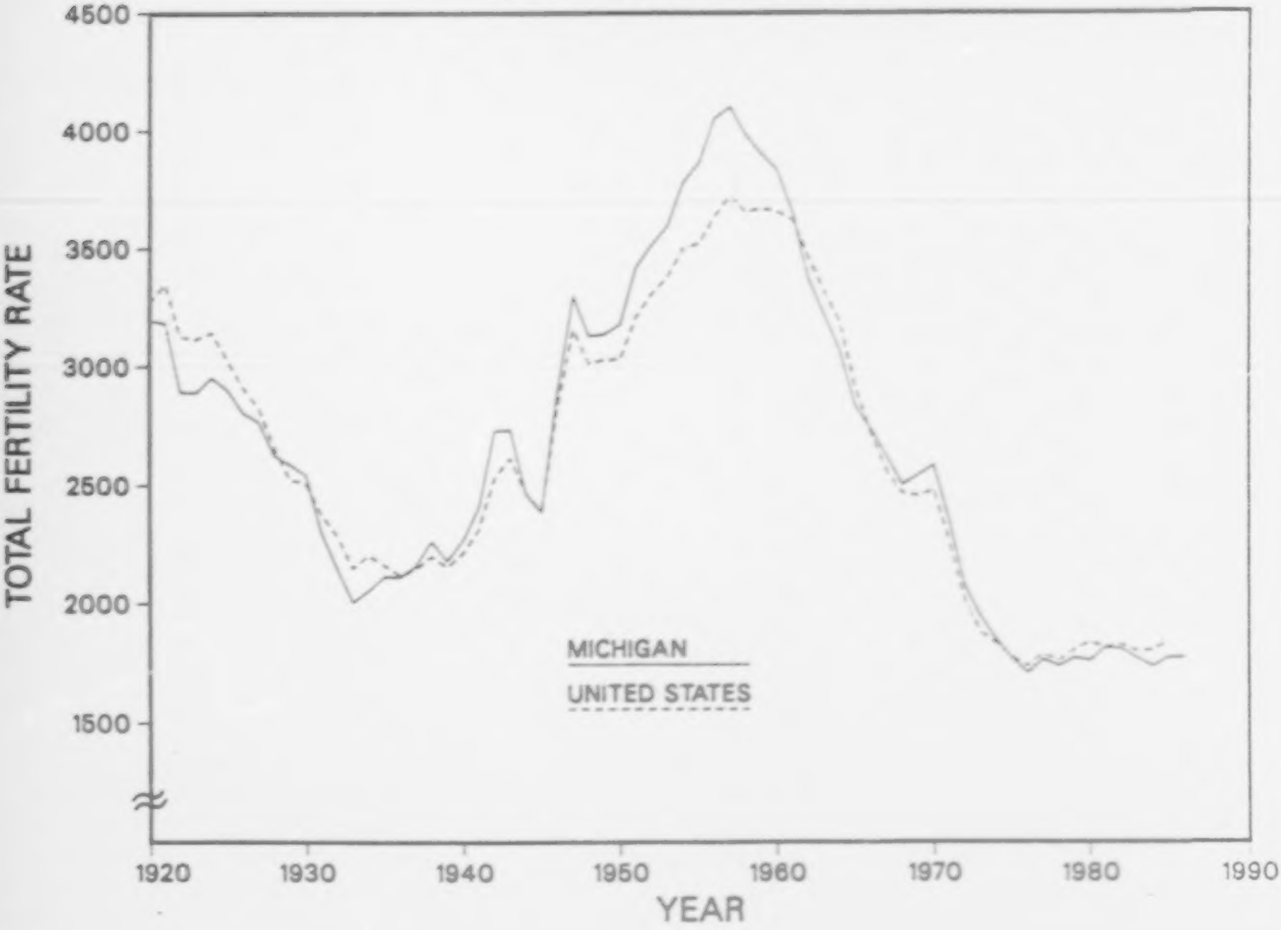
Live births of black persons increased from 15.7 percent of the total in 1970 to 18.2 percent in 1973 and then fluctuated to 17.5 percent of all live births in 1986. Live births of all other races increased from 0.4 percent in 1970 to 1.3 percent in 1981, held at that level through 1983 and increased to 1.7 in 1986.

It should be noted that Indians from India were classified as white before 1978 and among Asian or Pacific Islanders since 1978. Also changes in the method of determining the race of the infant born in 1984 to parents

Table 1.3
Fertility Rates, Michigan and United States Residents, Selected Years, 1900-1986

UNITED STATES	YEAR	MICHIGAN
---	1900	78.5
126.8	1910	99.0
117.9	1920	111.6
89.2	1930	87.6
79.9	1940	78.9
106.2	1950	110.5
118.0	1960	123.1
117.1	1961	119.0
112.0	1962	110.8
108.3	1963	106.6
104.7	1964	102.6
96.3	1965	95.9
90.8	1966	94.0
87.2	1967	90.8
85.2	1968	87.3
86.1	1969	89.6
87.9	1970	91.7
81.6	1971	84.5
73.1	1972	75.1
68.8	1973	71.2
67.8	1974	68.0
66.0	1975	65.5
65.0	1976	63.5
66.8	1977	65.9
65.5	1978	65.0
67.2	1979	66.6
68.4	1980	66.3
67.4	1981	65.6
67.3	1982	64.7
65.8	1983	62.7
65.4	1984	63.1
66.2	1985	63.8
64.9Pr.	1986	63.2

FIGURE 1.3
TOTAL FERTILITY RATES,[1] MICHIGAN AND UNITED STATES RESIDENTS, 1920-1986



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[1] Total fertility rate is total children to 1,000 women in their lifetime assuming constant live birth rates.

Table 1.4
Live Births by Infant's Race or National Origin, Michigan Residents, 1970 - 1986[1]

YEAR	TOTAL ALL RACES	WHITE[2]	BLACK	AMERICAN INDIAN	ASIAN OR PACIFIC ISLANDER[2,3]	OTHER[4]	UNKNOWN
1970	171,667	143,871	26,957	299	356	74	110
1971	162,244	134,165	27,245	313	373	40	108
1972	146,854	119,787	26,215	316	366	64	106
1973	141,550	114,878	25,741	302	288	144	197
1974	137,414	112,474	23,328	270	310	194	838
1975	133,931	109,718	23,224	294	331	184	180
1976	131,378	107,907	22,349	368	390	188	176
1977	138,416	114,042	23,195	431	365	221	162
1978	138,802	114,217	23,025	377	998	7	178
1979	144,452	118,671	24,010	435	1,117	13	206
1980	145,162	119,103	24,127	481	1,230	32	189
1981	140,579	115,972	22,705	526	1,256	16	104
1982	137,950	113,868	22,270	488	1,224	17	83
1983	133,026	109,335	21,932	490	1,154	25	90
1984	135,782	110,418	23,005	780	1,462	46	71
1985	138,052	112,994	22,659	748	1,486	52	113
1986	137,626	111,115	24,078	753	1,571	58	51

[1] Coding changes initiated in 1984 resulted in a net decrease of 0.7 and 0.1 percent of the infants coded to the races White and Black respectively. This change resulted in an increase in the number of infants coded to races other than White or Black in 1984.

[2] Persons of Spanish or of Mexican-American descent are included with White. Indians from India were counted as "White" from 1970-1977 and with "Other Asian or Pacific Islander" since 1978.

[3] Includes Chinese, Japanese, Hawaiian, Filipino, and other Asian or Pacific Islander.

[4] Includes Koreans for 1973-1977. Koreans are included in "Other Asian or Pacific Islander" for other years.

of different races resulted in a 0.7 percent decrease in the number of infants coded white and a 0.1 percent decrease in the number of infants coded black when compared to the numbers which would have been coded white and black in 1984 if the method used in 1983 had been retained. There was a corresponding increase in the number of births coded to a race or national origin other than white or black in 1984.

In absolute terms, the numbers of births of black and white infants declined between 1970 and 1976, with an especially sharp decline observed in births of white infants between 1970 and 1972. Between 1976 and 1980 the numbers of live births of white and black infants increased by 10.4 and 8.0 percent respectively. From 1980 through 1983 the numbers of white and black infants decreased to the second lowest and lowest numbers respectively since 1970. The numbers flucutated between 1984 and 1986 for both white and black infants.

The numbers of Asian or Pacific Islander births remained fairly stable between 1970 and 1977. A sharp increase in the number of births occurred in 1978 when births to Indians from India were added to this category. The numbers of American Indian births increased by about 64 percent between 1970 and 1983. Most of the increases observed in 1984 and 1986 for American Indians and Asian or Pacific Islanders were the result of coding changes.

Table 1.5 provides a comparison between crude birth rates and fertility rates for white and black persons in Michigan for the period since 1970. In 1970 the crude birth rate for black persons was 54.3 percent above that for white persons. By 1973, this percentage had increased to 71.7 percent. In 1974, the percent dropped sharply to 57.4, and by 1982 it had fallen to 20.7 percent. By 1986 the crude birth rate for black persons was 38.0 percent higher than the rate for white persons.

Paralleling the trends in numbers of live births, the crude birth rates for both groups declined between 1970 and 1976. Between 1976 and 1980 the crude birth rate for white persons increased by 10.3 percent, while that for black persons remained essentially unchanged. By 1986 the crude birth rates for white and black persons declined by 5.3 and 2.5 percent, respectively. The crude birth rate for white persons in 1986 was 22.8 percent below that observed in 1970 while the rate for the black group was 31.0 percent below the rate for 1970.

The fertility rates contained in Table 1.5 reveal that there are important differences in population structure for white persons compared to those of all other races. By comparing live births to the respective numbers of women aged 15-44 for these two groups, the relative differences in rates decrease. The fertility rate for other than white persons was 42.7 percent above the rate for white persons in 1970 and 24.7 percent higher in 1986. Since 1970 the fertility rate for black persons has declined 39.6 percent compared with a 30.9 percent drop for white persons.

AGE OF MOTHER

In 1986 41.0 percent of all live births were to women less than 25 years of age. Only 0.6 percent occurred to women 40 or more years of age. The median age of mothers was 26 years. Mothers of black infants were younger (median 24 years) than mothers of white children (median 26 years). Mothers of all other infants were older with a median age of 27 years.

Approximately 55.4 percent of the black infants were born to women aged 24 or less compared to 38.2 percent of the white infants and 31.8 percent of all other infants. This differential was the result of the relatively large percentage of black infants born to women at ages below 20 (Table 1.6).

Table 1.5
Crude Birth Rates and Fertility Rates by Race, Michigan Residents, 1970-1986

CRUDE BIRTH RATE			FERTILITY RATE	
WHITE RACE	BLACK RACE	YEAR	WHITE RACE	BLACK RACE
18.4	28.4	1970	88.0	125.6
17.0	27.6	1971	80.2	121.7
15.1	25.9	1972	70.6	112.9
14.5	24.9	1973	66.7	107.9
14.1	22.2	1974	64.5	94.8
13.8	21.6	1975	62.4	91.6
13.6	20.5	1976	60.7	85.5
14.4	20.8	1977	63.3	85.9
14.4	20.2	1978	62.6	82.5
14.9	20.6	1979	64.2	83.4
15.0	20.1	1980	63.9	80.7
15.2	18.5	1981	64.6	72.0
15.0	18.1	1982	63.9	69.9
14.6	17.7	1983	61.9	68.2
14.3	18.8	1984	61.0	73.7
14.6	18.5	1985	62.2	71.9
14.2	19.6	1986	60.8	75.8
-22.8	-31.0	Percent Change, 1970-1986	-30.9	-39.6

Table 1.6
Live Births and Percent Distribution by Age of Mother and Race of Child, Michigan Residents, 1986

AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Under 15 Years	335	0.2	90	0.1	242	1.0	3	0.1	-	-
15-19 Years	16,536	12.0	10,753	9.7	5,568	23.1	206	8.6	9	17.6
20-24 Years	39,611	28.8	31,525	28.4	7,525	31.3	550	23.1	11	21.6
25-29 Years	46,421	33.7	39,527	35.6	6,086	25.3	796	33.4	12	23.5
30-34 Years	26,331	19.1	22,366	20.1	3,379	14.0	577	24.2	9	17.6
35-39 Years	7,503	5.5	6,156	5.5	1,124	4.7	216	9.1	7	13.7
40 or More Years	877	0.6	689	0.6	152	0.6	34	1.4	2	3.9
Not Stated	12	0.0	9	0.0	2	0.0	-	-	1	2.0
Total	137,626	100.0	111,115	100.0	24,078	100.0	2,382	100.0	51	100.0
Median Age at Last Birthday	26	000	26	000	24	000	27	000	27	000

The total number of live births increased by 4.8 percent between 1976 and 1986 (Table 1.7) while the number of women of child bearing age (15 to 44 years of age) increased by 5.3 percent.

The largest relative decrease in the number of live births occurred to women under age 20. There was a 26.6 percent decrease in the number of births to these women while there was a 22.3 percent decrease in the number of women under age 20. The age group 20-24 experienced a 16.0 percent decline in births while they decreased 8.2 percent in numbers.

For these two age groups the percent decrease in the number of births was higher than the percent decrease in the number of women.

The number of live births to women 25-29 was 12.1 percent higher in 1986 than in 1976, while there was a 76.8 and 85.1 percent increase in the number of live births to women 30-34 years and 35-39 years of age respectively over the decade. There was a 3.7 percent increase in the number of live births to women 40 years of age or older. Although there were increases in the number of women in these age groups, the percent increase in the numbers

Table 1.7
Live Births and Population of Women by Age
Michigan Residents, 1976 and 1986

AGE GROUP	LIVE BIRTHS			POPULATION ESTIMATES		
	1976	1986	PERCENT CHANGE	1976	1986	PERCENT CHANGE
Under 20 Years[1]	22,997	16,871	-26.6	471,123	365,841	-22.3
20 - 24 Years	47,161	39,611	-16.0	424,794	390,024	-8.2
25 - 29 Years	41,412	46,421	+12.1	385,388	405,789	+5.3
30 - 34 Years	14,893	26,331	+76.8	303,602	385,338	+26.9
35 - 39 Years	4,053	7,503	+85.1	248,757	343,394	+38.0
40 and Over[2]	846	877	+3.7	233,471	286,637	+22.8
All Ages[3]	131,378	137,626	+4.8	2,067,135	2,177,023	+5.3

[1] Population shown is for females 15 - 19.

[2] Population shown is for females 40 - 44.

[3] Population shown is for females 15 - 44. Live births with age not stated are included only in the total.

of women were lower for the age groups between age 25 and 39 than the percent increase in the numbers of births.

Table 1.7 also provides the age distribution of the childbearing population in 1976 and 1986. The largest relative increase in population occurred in the age group 35-39, the age group with the greatest increase in live births between 1976 and 1986. The only groups to experience a population decline were those under 25 years of age.

AGE-SPECIFIC LIVE BIRTH RATES

As displayed in Table 1.8, a reduction in the age-specific live birth rates for Michigan females under 25 and over 39 years of age has occurred since 1976. The greatest relative decreases in rates between 1976 and 1986 were for women age 40 or over. The live birth rates for women 30-34 and 35-39 years old in 1986 were 39.1 and 33.7 percent above the rates for these age groups in 1976.

Figure 1.4 displays age-specific live birth rates for the period 1970-1986. Live birth rates in all age groups dropped between 1970 and 1976. For women under 20 years the rate continued to decline throughout the years 1976-1980. The rate fluctuated between 1980 and 1986 reaching a new low of 44.7 in 1984. The rate was 46.1 in 1986.

After declining between 1970 and 1976, the live birth rates for women between 20 and 29 years of age remained stable into the 1980's. The rates for women in the age groups 20-24 increased in 1981 then declined 17.3 percent to a low of 101.6 live births per 1,000 women in 1986.

The rates for women 25-29 declined between 1970 and 1976 then generally increase through 1980. The rates fluctuated between 1980 and 1986. The 1986 rate of 114.4 was 12.6 percent higher than the 1986 rate for women 20-24 years of age.

For women in the age groups 30-34 and 35-39 live birth rates decreased between 1970 and 1976 then increased by 45.6 and 45.3 percent, respectively by 1986.

In 1970, women aged 20-24 had the highest live birth rate of any age group, 14.3 percent higher than that of women aged 25-29. In 1976, 1979, 1980 and 1984 through 1986 the live birth rate of women in the 25-29 year age group was above that of women aged 20-24. In 1986 the rate for the 25-29 year age group was 12.6 percent higher (Table 4.4).

Table 1.8 displays age-specific live birth rates for white and black women and women of all other races for the years 1976 and ,1986. Generally, rates for black women under age 25 and over age 34 were above those for white women in both years. However, the live birth rate for white women between 25 and 29 years exceeded that for black women by 11.8 and 15.0 percent, respectively, in 1976 and 1986. In 1986 the rate for white women between 30 and 34 years also exceeded that for their black counterparts by 13.8 percent.

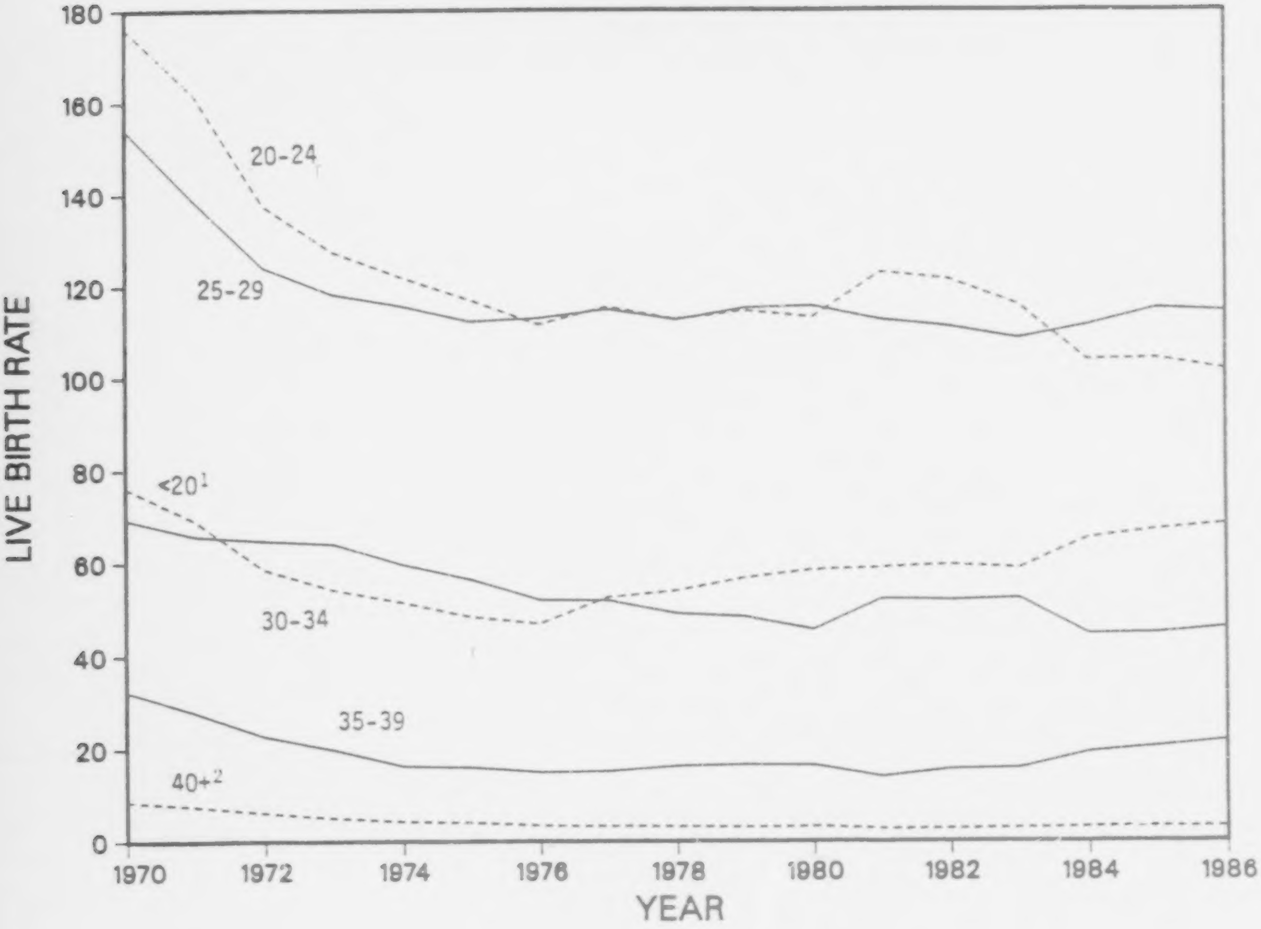
In 1976 the live birth rates for all other women were generally lower than the rates for white and black women. However in 1986 the rates for all other women 25 years of age or over were higher than the rates for white and black women.

Table 1.8
Age-Specific Live Birth Rates by Race, Michigan Residents, 1976 and 1986

AGE GROUP	RACE[1]											
	TOTAL			WHITE			BLACK			ALL OTHER[1]		
-	1976	1986	PERCENT CHANGE IN RATE	1976	1986	PERCENT CHANGE IN RATE	1976	1986	PERCENT CHANGE IN RATE	1976	1986	PERCENT CHANGE IN RATE
Under 20[2] Years	48.8	46.1	-5.5	39.6	36.1	-8.8	111.0	96.3	-13.2	28.2	43.6	+54.6
20-24 Years	111.0	101.6	-8.5	107.0	96.8	-9.5	141.1	126.2	-10.6	52.5	119.3	+127.2
25-29 Years	107.5	114.4	+6.4	109.3	116.2	+6.3	97.8	101.0	+3.3	69.8	146.1	+109.3
30-34 Years	49.1	68.3	+39.1	48.7	69.2	+42.1	51.3	60.8	+18.5	43.4	88.3	+103.5
35-39 Years	16.3	21.8	+33.7	15.4	21.1	+37.0	22.2	24.3	+9.5	20.0	36.8	+84.0
40 or Over[3]	3.6	3.1	-13.9	3.3	2.8	-15.2	6.3	4.3	-31.7	2.9	8.2	+182.8
Total[4]	63.6	63.2	-0.6	60.6	60.8	+0.3	85.5	75.8	-11.3	39.4	75.9	+92.6

[1] Data on race not stated are included only in the total columns.
[2] Age-specific birth rates for under 20 are based on female population 15-19.
[3] Age-specific birth rates for 40 and over are based on female population 40-44.
[4] Total birth rates (fertility rates) are based on female population 15-44.

FIGURE 1.4
AGE-SPECIFIC LIVE BIRTH RATES, MICHIGAN RESIDENTS, 1970-1986



[1] Based on live births to women under 20 and population of females 15-19.
[2] Based on live births to women 40 or over and population of females 40-44.

The live birth rate for black women age 15 to 44 (85.5) was 41.1 percent higher than the rate for white women in 1976. By 1986 the difference between the rates was less. The rate for black women was 24.7 percent higher than the rate for white women. During the ten years the rate for black females declined by 11.3 percent while the rate for white females increased slightly.

This pattern was observed in all age groups of white and black women. The rates for females below age 25 and 40 or over declined more for black females than for white females. Correspondingly the rates increased less for black females between 25 and 39 years of age than their white counterparts. The rates for all other women rose overall and for each age group during the ten years.

BIRTH ORDER

The percent of live births which were first-order births is displayed in Figure 1.5 and Table 1.9 for Michigan and the United States for the period since 1960. Between 1960 and 1970, the percent of first-order births increased from 22.9 to 37.4 in Michigan and by 1980 the percent had increased to 42.4. Then the percentage steadily decreased to 40.1 in 1985, the lowest level since 1972.

The percentage increased slightly in 1986 to 40.4 percent. The actual number of first births declined by 15.9 percent between 1970 and 1976, increased between 1976 and 1980 by 13.9 percent and decreased by 11.8 percent between 1980 and 1983. By 1986 the number of first births increased by 2.5 percent. The trend in first births is similar for the United States .

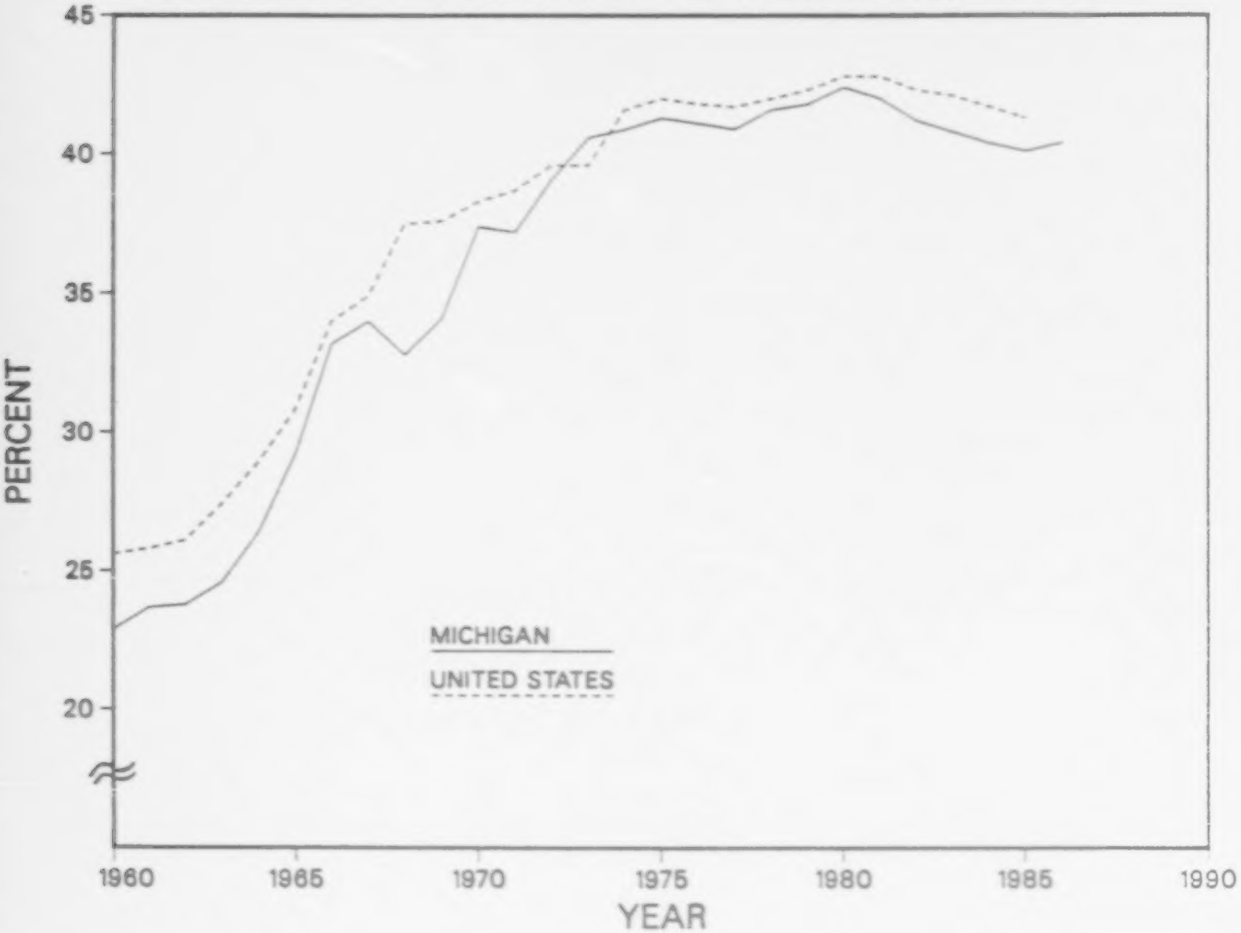
The distribution of Michigan resident live births by live birth order is displayed in Tables 1.10 and 1.11 for the years 1976 and 1986. The distributions of births by birth order in were similar 1976 and 1986. Of the births where birth order was known, first- and second-order live births comprised 74.1 percent of all live births in 1976 and 73.8 percent in 1986. On the other hand, 10.4 percent of all live births in 1976 were fourth or higher order live births. In 1986 the figure was 9.6 percent. The greatest relative decline occurred in fifth or higher order live births. These constituted 4.5 percent of all live births in 1976 compared to 3.6 percent in 1986.

The distribution of births for women under 25 years of age were about the same in 1976 and 1986. For women under age 20 about 79 to 80 percent of the births were first-order births, about 17 or 18 percent were second-order births and about 3 percent were third- or higher-order births. For women 20 to 24 years of age the corresponding percentages of first-order births were 46.6 and 49.2 percent in 1976 and 1986 respectively, the percentages of second-order births were 37.6 and 34.8 percent while about 16 percent were third- or higher-order births.

The percent of first order births increased for women 25 years or over between 1976 and 1986. In 1976 28.4 percent of the births to women 25-29 years of age were first order births. By 1986 the percent of first order births had risen to 33.7 percent. For women 30 to 39 years of age the percent of first-order births rose from 13.6 percent in 1976 to 20.8 percent in 1986. For births to women 40 or over the percentages of first-order births were 6.1 and 9.2 percent respectively in 1976 and 1986.

FIGURE 1.5

FIRST BIRTHS AS A PERCENTAGE OF ALL LIVE BIRTHS, MICHIGAN AND UNITED STATES RESIDENTS, 1960-1986[1]



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[1] United States data for 1986 are provisional.

TABLE 1.9

First Births, Michigan and United States Residents, Selected Years, 1960 - 1986

UNITED STATES		YEARS	MICHIGAN	
FIRST BIRTHS	PERCENT OF ALL BIRTHS		FIRST BIRTHS	PERCENT OF ALL BIRTHS
1,090,152	25.6	1960	44,711	22.9
1,157,386	30.8	1965	48,660	29.2
1,430,680	38.3	1970	64,222	37.4
1,375,668	38.7	1971	60,413	37.2
1,289,257	39.6	1972	57,477	39.1
1,243,358	39.6	1973	57,411	40.6
1,314,194	41.6	1974	56,233	40.9
1,319,126	42.0	1975	55,348	41.3
1,324,811	41.8	1976	54,003	41.1
1,387,143	41.7	1977	56,622	40.9
1,401,491	42.0	1978	57,767	41.6
1,479,260	42.3	1979	60,424	41.8
1,545,604	42.8	1980	61,516	42.4
1,553,665	42.8	1981	59,105	42.0
1,555,627	42.3	1982	56,879	41.2
1,530,639	42.1	1983	54,271	40.8
1,529,905	41.7	1984	54,907	40.4
1,554,788	41.3	1985	55,373	40.1
--	--	1986	55,615	40.4

The percent of second order births born to women 25-29 years of age were about the same in 1976 and 1986 at 38.5 and 37.5 percent. The percent of these births born to women over 29 years of age increased from 25.9 percent to 34.2 percent for women age 30-39 and from 8.1 to 16.6 percent for women over 40 years of age.

Between 1976 and 1986 the percent of third- or higher-order births decreased for women 25-29 years of age from 33.0 percent to 28.7 percent. The largest change occured for women age 30-39 with a decrease of third- or higher-order births from 60.5 percent to 45.0 percent. The decrease for women 40 or over years of age was from 85.8 to 74.3 percent.

The median age of mothers having their first child increased from 22 to 23 between 1976 and 1986. For mothers having their second child, the median age also increased from 24 to 26. The median ages for mothers increased for all birth orders between 1976 and 1986, except fifth order births or greater, which decreased from 33 to 32.

Table 1.10
Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1976

LIVE BIRTH ORDER	AGE OF MOTHER							
	UNDER 20 YEARS	20-24 YEARS	25-29 YEARS	30-39 YEARS	40 OR MORE YEARS	NOT STATED	ALL AGES	MEDIAN AGE AT LAST BIRTHDAY
First Birth	17,935	21,786	11,670	2,555	51	6	54,003	22
Second Birth	4,057	17,575	15,814	4,871	68	4	42,389	24
Third Birth	550	5,721	8,855	4,809	97	-	20,032	27
Fourth Birth	64	1,282	3,186	3,028	124	1	7,685	28
Fifth Birth or Greater	9	360	1,519	3,515	497	1	5,901	33
Not Stated	382	437	368	168	9	4	1,368	000
All Birth Orders	22,997	47,161	41,412	18,946	846	16	131,378	24

Table 1.11
Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1986

LIVE BIRTH ORDER	AGE OF MOTHER							
	UNDER 20 YEARS	20-24 YEARS	25-29 YEARS	30-39 YEARS	40 OR MORE YEARS	NOT STATED	ALL AGES	MEDIAN AGE AT LAST BIRTHDAY
First Birth	13,530	19,422	15,589	6,990	80	4	55,615	23
Second Birth	2,805	13,740	17,357	11,510	144	2	45,558	26
Third Birth	436	4,736	8,957	8,415	181	0	22,725	28
Fourth Birth	56	1,200	2,960	3,848	158	0	8,222	29
Fifth Birth or Greater	10	372	1,370	2,902	307	1	4,962	32
Not Stated	34	141	188	169	7	5	544	27
All Birth Orders	16,871	39,611	46,421	33,834	877	12	137,626	26

First births to women 25 years of age or older comprised 26.4 percent of all first births in 1976 and 40.7 percent in 1986. Similarly, second order births to women 25 years or older increased from 49.0 percent of all second order births in 1976 to 63.7 percent in 1986. This change in mother's age at birth was reflective of the emergence of the 25-29 year age group as the group with the highest age-specific birth rate (Table 1.8).

INTERPREGNANCY TIME PERIOD

The distributions of live births by interpregnancy time period were similar in 1976 and 1986. In both years fewer than 4 percent of the births occurred less than a year after the termination of the most recent prior pregnancy (Table 1.12). Another 28.3 and 31.3 percent of the births were to women with prior deliveries occurring one to two years after the most recent pregnancy termination. About 24 percent of the births had spacings of two to three years. A lower percentage of births had a spacing of 3 to 5 years in 1986 (22.9 percent) than in 1976 (25.8 percent). In both years about 18 percent of the births were to women five or more years after the termination of their most recent prior pregnancy.

In 1986 women having live births whose most recent prior termination was a fetal death had a median time span of 2 years between their previous termination and a live birth (Table 1.13). This compares to a median of 2 years 8 months for prior live births. Although 1 to 2 years was the modal time span for both groups, the percent of women with prior fetal deaths in this interval (40.1) was much larger than that for women with prior live births (28.4). The greatest relative difference was associated with time spans of less than one year. A spacing of less than one year was observed for 9.5 percent of all women reporting their most recent prior pregnancy as a fetal death. This compares to 1.6 percent of all women reporting their most recent prior pregnancy as a live birth.

PRENATAL CARE

The most common month of pregnancy in which women first obtain prenatal care was the second month. In 1986 41.2 percent of all women having live births initiated care during the second month. The median number of prenatal visits was 12, and 62.2 percent of all live births were to women receiving 10-14 prenatal visits. Table 1.14 indicates the relationship between the month of pregnancy prenatal care began and the number of prenatal visits. For births in which the mother began receiving care in the first month, the median number of visits was 13. The median number of visits was lower for women where prenatal care began later in the pregnancy.

The proportion of live births to women who initially obtained prenatal care in the first trimester of pregnancy was 79.8 percent in 1986. This percent has increased steadily since 1970 when the figure was 69.0 (Figure 1.6). However the proportion in 1986 was lower than the proportion in 1985 (81.0 percent).

There were also small but steady increases in the percentage of births to women receiving care prior to the sixth month of pregnancy over the period 1970-1975. In 1970, 86.0 percent of all live births were to women who received care prior to the sixth month of pregnancy. By 1975, this had risen to 91.6 percent. The figure remained at that level through

Table 1.12
Live Births to Women Reporting Prior Pregnancy Terminations[1] by Time Span Between Last and Current Termination, Michigan Residents, 1976 - 1986[2]

TIME SPAN IN YEARS	1976		1986	
	NUMBER	PERCENT	NUMBER	PERCENT
Total	80,711	100.0	91,357	100.0
Less Than One	2,641	3.3	3,239	3.5
1 < 2	22,838	28.3	28,591	31.3
2 < 3	19,576	24.3	21,758	23.8
3 < 5	20,861	25.8	20,936	22.9
5 or More . .	14,795	18.3	16,833	18.4
Median Time Span . .	2 Years 8 Months		2 Years 6 Months	

[1] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[2] The methodology for calculating interpregnancy time span was altered slightly in 1984. Hence, median time spans and percentages are not comparable to statistics published in prior years.

1981. By 1985 the percent of all women who received care before the sixth month was 93.9 percent. The percentage decreased to 93.3 percent in 1986.

The proportion of births to women receiving early prenatal care varied considerably by race of infant and age of mother (Table 1.15). In 1986, 82.2 percent of white infants compared to 69.1 percent of the black infants were born to mothers who began their prenatal care in the first trimester. Over 85.9 percent of the women 25 through 39 years of age sought care promptly. The proportion of births to women receiving early prenatal care declined as maternal age increased or decreased from 30-34 years of age, falling to 76.6 percent for women 40 years or over and 34.3 percent for women under 15 years. About six in ten (57.6 percent) mothers 15-19 years of age received care early. Similar patterns in this proportion by age of mother are evident for white, black and all other infants.

The time prenatal care began varied with live birth order (Table 1.16). The proportion of live births to women who began care during the first trimester was highest for second order live births (82.4 percent) and lowest for fifth or higher order births (67.0 percent). Conversely, the proportion of births to women who began care during the third trimester, or received no care, was lowest (2.7 percent) for second order live births. This

FIGURE 1.6
PERCENT OF WOMEN HAVING LIVE BIRTHS WHO RECEIVED CARE PRIOR TO THE 4TH MONTH AND 6TH MONTH OF PREGNANCY, MICHIGAN RESIDENTS, 1970-1986

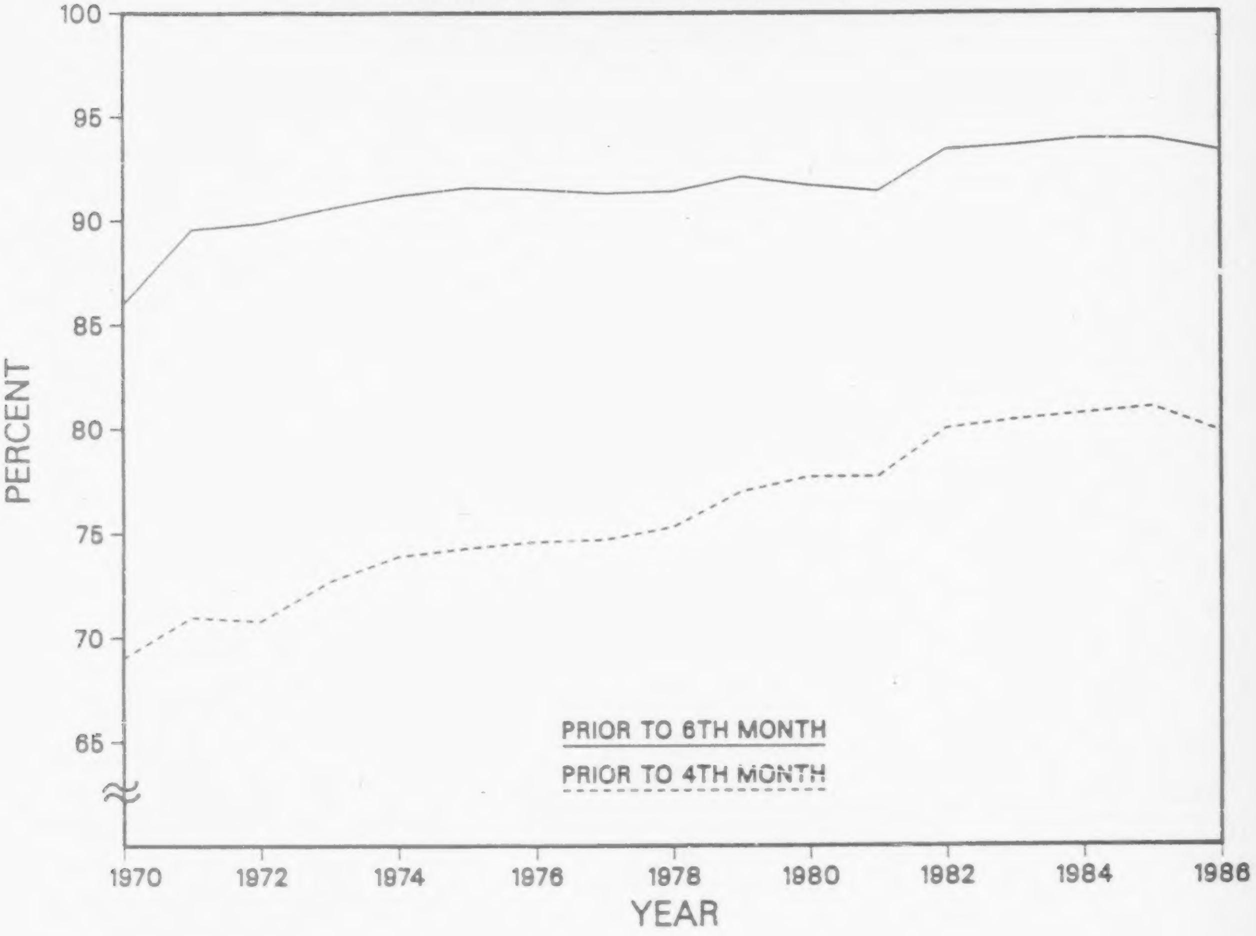

Table 1.13

Live Births to Women Reporting Prior Pregnancy Terminations[1] by Time Span Between Last and Current Termination and Whether Prior Termination Resulted in a Live or Non-live Birth[2], Michigan Residents, 1986[3]

TIME SPAN IN YEARS	TOTAL		PRIOR NON-LIVE BIRTH		PRIOR LIVE BIRTHS	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	91,357	100.0	22,424	100.0	68,933	100.0
Less Than One	3,239	3.5	2,131	9.5	1,108	1.6
1 < 2	28,591	31.3	8,999	40.1	19,592	28.4
2 < 3	21,758	23.8	3,859	17.2	17,899	26.0
3 < 5	20,936	22.9	3,575	15.9	17,361	25.2
5 or More . .	16,833	18.4	3,860	17.2	12,973	18.8
Median Time Span . .	2 Years 6 Months		2 Years 0 Months		2 Years 8 Months	

[1] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[2] Non-live birth as defined for the pregnancy history on the birth record is a fetal death of any gestational age.

[2] The methodology for calculating interpregnancy time span was altered slightly in 1984. Hence, median time spans and percentages are not comparable to statistics published in prior years.

figure increased with the number of previous live births. Among fifth order live births 8.2 percent were to women who had received no care by the beginning of the 7th month of the pregnancy.

The proportion of live births to mothers having ten or more prenatal visits was 77.4 percent in 1986 compared to 70.2 percent in 1980. This statistic varied considerably by race. While mothers of 78.9 percent of white infants had at least ten prenatal visits, the percentages were only 71.4 and 72.1 for black and all other infants, respectively (Table 1.17). The median number of prenatal visits was 12 for mothers of children of all races. The mean number of prenatal visits was 11.7 for mothers of white infants, 4.5 percent higher than the mean of 11.2 visits for mothers of black infants. The mean number of visits for mothers of infants of all other races was slightly lower than the mean for mothers of black infants.

In 1986, 1,195 resident live births, or 8.7 of every 1,000, occurred with the mother having had no prenatal care. This figure includes only those where it was specified that the mother received no prenatal care. The comparative statistics were 6.3 in 1985 and 11.8 in 1971. In 1985 865 resident live births were born to mothers having no prenatal care.

Those who received no prenatal care were for the most part younger mothers (median age

Table 1.14
Live Births by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1986

MONTH CARE BEGAN	NUMBER OF VISITS								
	TOTAL	NONE	1 - 4	5 - 9	10 - 14	15 - 19	20 OR OVER	UN-KNOWN	MEDIAN NO. OF VISITS
Total	137,626	1,195	3,255	23,861	85,604	17,408	3,633	2,670	12
First	21,165	-	120	1,283	12,078	6,454	1,032	198	13
Second	56,769	-	276	5,198	41,550	7,487	1,601	657	12
Third	31,876	-	345	5,912	21,870	2,514	685	550	12
Fourth	12,201	-	320	4,269	6,514	653	233	212	10
Fifth	6,331	-	376	3,202	2,401	196	49	107	9
Sixth	3,586	-	448	2,161	822	70	19	66	8
Seventh	2,063	-	504	1,293	220	10	5	31	6
Eighth	1,008	-	544	402	41	8	1	12	4
Ninth	320	-	247	39	18	4	2	10	2
No Care	1,195	1,195	-	-	-	-	-	-	-
Unknown	1,112	-	75	102	90	12	6	827	8

of 22). Also, the lack of prenatal care was disproportionately high among mothers of black infants. The ratio of live births in which the mother received no prenatal care to the total number of live births was 4.6 times as large for black infants than for white infants in 1986 (Table 1.18). The ratio was 3.0 times as large for black infants than for all other infants.

A measure of the quality of care has been developed by Dr. D. W. Kessner which combines information on the month prenatal care began, the gestational age at birth and the number of prenatal visits. Adequate prenatal care is defined as care which began within the first trimester and which included an average of at least one or two additional prenatal visits per month of gestation depending on the length of gestation.

Intermediate care is defined as care which began during the second trimester of the pregnancy with corresponding fewer visits or which began during the first trimester but there were a few less visits than would be appropriate for the length of gestation. Finally, care is defined as inadequate when no care was received or if care began during the third trimester. It is also defined as inadequate if care began during the first or second trimester but less than five visits occurred, when the length of gestation was 34 weeks or more. When the length of gestation was less than 34 weeks, care was defined as inadequate when

Table 1.15
Numbers and Percents of Live Births with Prenatal Care Beginning in the First Trimester by Age of Mother and Race of Child, Michigan Residents, 1986

AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Under 15 Years	115	34.3	34	37.8	79	32.6	2	*	-	-
15-19 Years	9,529	57.6	6,457	60.0	2,974	53.4	95	46.1	3	*
20-24 Years	30,013	75.8	24,403	77.4	5,234	69.6	369	67.1	7	63.6
25-29 Years	39,873	85.9	34,531	87.4	4,723	77.6	612	76.9	7	58.3
30-34 Years	23,161	88.0	19,996	89.4	2,678	79.3	482	83.5	5	*
35-39 Years	6,444	85.9	5,411	87.9	853	75.9	177	81.9	3	*
40 Years or Over	672	76.6	543	78.8	105	69.1	24	70.6	-	-
Not Stated	3	*	3	*	-	-	-	-	-	-
Total	109,810	79.8	91,378	82.2	16,646	69.1	1,761	73.9	25	49.

[1] Percent denominators obtained from Table 1.6

Table 1.16
Live Births by Month of Pregnancy Prenatal Care Began and Live Birth Order, Michigan Residents, 1986

MONTH OF PREGNANCY CARE BEGAN	NUMBER OF VISITS						
	TOTAL	FIRST	SECOND	THIRD	FOURTH	FIFTH OR GREATER	NOT STATED
1st Month . .	21,165	8,583	7,464	3,373	1,090	568	69
2nd Month . .	56,769	23,009	19,686	9,262	3,068	1,566	178
3rd Month . .	31,876	12,664	10,412	5,511	1,987	1,172	130
4th Month . .	12,201	4,920	3,637	2,110	881	609	44
5th Month . .	6,331	2,730	1,779	976	448	360	38
6th Month . .	3,586	1,506	1,036	560	278	189	17
7th Month . .	2,063	884	580	301	149	139	10
8th Month . .	1,008	385	282	177	84	75	5
9th Month . .	320	120	92	53	25	29	1
No Care	1,195	407	271	214	128	164	11
Not Stated . .	1,112	407	319	188	84	73	41
Total	137,626	55,615	45,558	22,725	8,222	4,962	544
Percentage Beginning Care in First Trimester . . .	79.8	79.6	82.4	79.9	74.7	67.0	69.3
Percentage Without Care During First Six Months . .	3.3	3.2	2.7	3.3	4.7	8.2	5.0

care began during the first or second trimester but even fewer than five visits occurred.

Adequate prenatal care was obtained by mothers of 72.8 percent of the live births (Table 1.19). The proportion of live births to mothers of white infants who received adequate care (75.2 percent) was higher than the corresponding proportion for mothers of black (62.4) and all other infants (66.3 percent). Inadequate care was received by the mothers of 5.9 percent of all live births. The proportions of live births to mothers who received inadequate care were 5.1 percent for white infants, 9.6 percent for black infants and 7.6 percent for all other infants.

Table 1.17
Live Births and Percent Distribution by Number of the Mother's Prenatal Visits and Race of Child, Michigan Residents, 1986

NUMBER OF PRENATAL VISITS	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
None	1,195	0.9	590	0.5	582	2.4	19	0.8	4	7.8
1-4	3,255	2.4	2,007	1.8	1,156	4.8	90	3.8	2	3.9
5-9	23,861	17.3	18,586	16.7	4,760	19.8	508	21.3	7	13.7
10-14	85,604	62.2	71,329	64.2	12,868	53.4	1,390	58.4	17	33.3
15-19	17,408	12.6	13,356	12.0	3,764	15.6	281	11.8	7	13.7
20 or Over	3,633	2.6	3,019	2.7	569	2.4	45	1.9	0	0.0
Not Stated	2,670	1.9	2,228	2.0	379	1.6	49	2.1	14	27.5
Total	137,626	100.0	111,115	100.0	24,078	100.0	2,382	100.0	51	100.0
Median Number of Visits	12	000	12	000	12	000	12	000	12	000
Mean Number of Visits	11.6	000	11.7	000	11.2	000	11.1	000	10.3	000

Table 1.18
Live Births with No Prenatal Care by Age of Mother and Race of Child, Michigan Residents, 1986

AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATIO[1]	NUMBER	RATIO[1]	NUMBER	RATIO[1]	NUMBER	RATIO[1]	NUMBER	RATIO[1]
Under 15 years	20	59.7	3	*	17	70.2	-	-	-	-
15-19 Years	334	20.2	160	14.9	163	29.3	8	38.8	3	*
20-24 Years	377	9.5	201	6.4	171	22.7	5	*	-	-
25-29 Years	254	5.5	130	3.3	120	19.7	4	*	-	-
30-39 Years	195	5.8	86	3.0	106	23.5	2	*	1	*
40 Years or Over	13	14.8	8	11.6	5	*	-	-	-	-
Not Stated	2	*	2	*	-	-	-	-	-	-
Total	1,195	8.7	590	5.3	582	24.2	19	8.0	4	*
Median Age at Last Birthday	22	000	23	000	22	000	22	000	16	000

[1] Ratio per 1,000 live births. Ratio denominator obtained from Table 1.6.

Table 1.19
Number and Percent of Live Births
by Level of Prenatal Care and Race of Child, Michigan Residents, 1986

LEVEL OF PRENATAL CARE (KESSNER INDEX[1])	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Adequate	100,146	72.8	83,520	75.2	15,025	62.4	1,579	66.3	22	43.1
Intermediate	26,639	19.4	19,814	17.8	6,259	26.0	562	23.6	4	7.8
Inadequate	8,138	5.9	5,641	5.1	2,305	9.6	182	7.6	10	19.6
Unknown	2,703	2.0	2,140	1.9	489	2.0	59	2.5	15	29.4
Total	137,626	100.0	111,115	100.0	24,078	100.0	2,382	100.00	51	100.0

[1] The Kessner Index is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

Although the mothers of 79.8 percent of all live births received prenatal care during the first trimester, only 72.8 received adequate care as defined by the Kessner Index. Mothers of 7.0 percent of white infants began prenatal care during the first trimester but failed to receive an adequate number of prenatal visits during the pregnancy. The percentages for black and all other infants were 6.7 and 7.6, respectively (Tables 1.15 and 1.19). Overall, this means that 7.0 percent of the mothers who initiate prenatal care most promptly did not receive the minimum number of visits they should have received during the time they were pregnant. Considered as a proportion of the mothers who did not receive adequate care, 25.8 percent of the mothers not receiving adequate care initiated care within the recommended first trimester but did not continue to receive the appropriate minimum number of prenatal care visits.

BIRTH WEIGHT

The mean weight for all live births was 3,357 grams or approximately 7 pounds 6 ounces. The median weight was 3,402 grams or about 7 pounds 8 ounces (Table 1.20). For black infants the mean (3,084.3 grams) and median (3,160 grams) birth weights were much lower than the mean and median birth weights for white infants. For all other infants, the median and mean birth weights were 74.8 and 90 grams less than the median and mean for white infant but were 257.2 and 180 grams higher than the birth weights of black infants.

A subgroup of major importance when analyzing birth weight trends is the category of infants weighing less than 2,500 grams (approximately 5 pounds 8 ounces or less) at birth. Such infants have historically experienced higher mortality in their first year of life than heavier infants. In 1986, 69.3 of every 1,000 live births weighed less than 2,500 grams (Table 1.21).

The proportion of low birth weight infants varies with the race of the child, the age of the mother, and the amount and adequacy of prenatal care the mother has received. Mothers that are very young, black or of races other than black or white have fewer prenatal visits. Black women also have higher birth rates in the younger age groups. Tables 1.21, 1.22 and 1.23 present data on these variables with respect to birth weight.

The age group with the highest low birth weight ratio (143.3) was the group of mothers under 15 years of age. This ratio was lower for each succeeding age group through age group 25-29 (61.7) then increased for the older age groups to 103.8 per 1,000 live births for mothers 40 years or over (Table 1.21).

The low birth weight ratio for black infants was 140.1 compared with 54.3 for white infants and 50.4 for all other infants (Table 1.21). The low birth weight ratios for black infants vary less by age of mother than those for white infants. For white infants the ratio associated with mothers under 15 years of age (144.4) was almost three times that of mothers in the 25-29 year age group (48.9). For black infants the differential between the age groups with the highest and lowest ratios was about 1.8 times.

The ages of mothers associated with the lowest low birth weight ratio were 25-29 for white infants (48.9) and 15-19 years of age (126.4) for black infants. Where rates could be calculated, the low birth weight ratios for

Table 1.20
Live Births by Birth Weight and Race, Michigan Residents, 1986

WEIGHT AT BIRTH	RACE				
	TOTAL	WHITE	BLACK	ALL OTHER	NOT STATED
500 Grams or Less	322	148	169	5	-
501 - 1,000 Grams	690	387	298	5	-
1,001 - 1,500 Grams	867	517	343	5	2
1,501 - 2,000 Grams	1,832	1,192	618	22	-
2,001 - 2,499[1] Grams	5,826	3,794	1,945	83	4
2,500 - 3,000 Grams	21,600	15,392	5,779	416	13
3,001 - 3,500 Grams	49,264	39,337	8,944	971	12
3,501 - 4,000 Grams	41,043	35,633	4,749	649	12
4,001 - 4,500 Grams	13,336	12,124	1,034	175	3
4,501 Grams or More	2,807	2,566	190	51	-
Not Stated	39	25	9	-	5
Total	137,626	111,115	24,078	2,382	51
Mean Weight in Grams	3,356.8	3,416.3	3,084.3	3,341.5	3,113.0
Median Weight in Grams	3,402.0	3,430.0	3,160.0	3,340.0	3,175.0

[1] In order to conform to national standards, the definition of low birthweight was changed in 1984 to less than 2500 grams.

all other births were close to and sometimes lower than the ratios for white infants.

When low birth weight ratios are examined by the number of the mother's prenatal visits even more striking variations are evident. The low birth weight ratio for the highest risk group was 6.6 times that of the group with the lowest ratio. The low birth weight ratio was highest when the mother had no prenatal care at 292.1. The ratio declined as the number of prenatal visits increased through 10-14 visits, where the ratio was 44.5. The low birth weight ratio was 80.6 for mothers with 20 or more prenatal visits. It is likely that a very high number of prenatal visits is associated with problems in the pregnancy (Table 1.22).

Black and white infants show similar patterns of rising and falling ratios varying with the frequency of prenatal visits (Table 1.22). The low birth weight ratio for black infants varied from a high of 395.2 where the mother had no care to a low of 92.5 where the mother had 15 to 19 or more visits. The ratio for white infants varied from a high of 198.3 where the mother had no care or fewer than five visits

Table 1.21
Low Weight[1] Live Births and Low Birth Weight Ratios by Age of Mother and Race of Child, Michigan Residents, 1986

AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]
Under 15 Years	48	143.3	13	144.4	34	140.5	1	*	-	-
15-19 Years	1,508	91.2	788	73.3	704	126.4	15	72.8	1	*
20-24 Years	2,789	70.5	1,779	56.4	975	129.6	34	61.8	1	*
25-29 Years	2,863	61.7	1,931	48.9	891	146.4	40	50.3	1	*
30-39 Years	2,235	66.1	1,468	51.5	734	163.0	30	37.8	3	*
40 Years or Over	91	103.8	57	82.7	34	223.7	-	-	-	-
Not Stated	3	*	2	*	1	*	-	-	-	-
Total	9,537	69.3	6,038	54.3	3,373	140.1	120	50.4	6	117.6
Median Age at Last Birthday	25	.000	26	.000	24	.000	25	.000	25	.000

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[1] Less than 2,500 grams.
[2] Ratio denominators obtained from Table 1.6.

Table 1.22
Low Weight[1] Live Births and Low Birth Weight Ratios by Number of Prenatal Visits and Race of Child, Michigan Residents, 1986

NUMBER OF PRENATAL VISITS	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]
None	349	292.1	117	198.3	230	395.2	2	*	-	-
1-4	811	249.2	398	198.3	400	346.0	13	144.4	-	-
5-9	3,112	130.4	2,184	117.5	890	187.0	37	72.8	1	*
10-14	3,813	44.5	2,402	33.7	1,358	105.5	49	35.3	4	*
15-19	826	47.4	470	35.2	348	92.5	8	28.5	-	-
20 or Over	293	80.6	226	74.9	63	110.7	4	*	-	-
Not Stated	333	124.7	241	108.2	84	221.6	7	142.9	1	*
Total	9,537	69.3	6,038	54.3	3,373	140.1	120	50.4	6	117.6
Median Number of Visits	10	000	10	000	10	000	10	000	11	000
Mean Number of Visits	9.7	000	9.9	000	9.3	000	9.4	000	11.0	000

[1] Less than 2500 grams

[2] Ratio denominators obtained from Table 1.17

to a low of 33.7 where the mother had 10 to 14 prenatal visits.

The greatest relative difference between the low birth weight ratios was observed for births to mothers with 10-14 visits. The ratio for black infants was 3.1 times the ratio for white infants. Overall, the low birth weight ratio for black infants was 2.6 times the ratio for white infants. This high overall difference in the low birth weight ratios is associated with a differential in the proportion of mothers having had fewer than 10 prenatal visits. While 19.0 percent of mothers having white infants had less than 10 prenatal visits, the corresponding figure for mothers having black infants was 27.0 percent (Table 1.17).

For low birth weight infants the median number of the mother's prenatal visits was 10, compared to 12 for all infants. The mean number of visits for mothers of low birth weight infants was 9.7, 16.4 percent less than the mean of 11.6 for mothers of all infants. As low birth weight infants are more likely to have been born prematurely, the shorter prenatal period results in a reduction of the potential length of time for prenatal care.

The low birth weight ratio varied by adequacy of prenatal care as indicated by the Kessner Index (Table 1.23). The ratio was 2.0 times higher for white infants born to mothers with inadequate care than to mothers with adequate prenatal care. For black infants the low birth weight ratio was 1.8 times higher when the mother received inadequate care rather than adequate care. The ratio was 1.6 times higher for white infants born to women with intermediate care than for white infants born to women with adequate care. For black infants the ratio was 1.2 times higher when the mother received an intermediate level of care. For all other infants the ratios of low birth weight for women who receive inadequate and intermediate care were 1.8 and 1.7 times higher than the ratio for women who received adequate care.

At birth about 14 percent of the black infants weighed less than 2500 grams. Of black infants born to women with adequate care, a lower percentage (12.2) weighed less than 2500 grams. The low weight ratio for black infants born to women with adequate care was still higher than the ratio for white and all other infants at any level of prenatal care. The low birth weight ratio was 2.6 and 3.1 times higher for black infants born to women with adequate care than for the corresponding white and all other infants.

The low birth weight ratios were higher for white infants than for other than white or black infants born to women receiving each level of care. For all other infants born to women with adequate care, the low birth weight ratio was 13.6 percent lower than the corresponding ratio for white infants.

Figure 1.7 displays the low birth weight ratio for Michigan and the United States over the last twenty-seven years. In 1960 this ratio was 72.0 for Michigan. Between 1960 and 1966 the ratio increased, reaching a high for the 27 year period in 1966 (79.8). Since that time the ratio has generally declined. The ratio for 1985 was 68.1, the lowest rate since 1960. It rose to 69.3 in 1986. The pattern for the United States has been similar. The ratio increased from 76.9 in 1960 to 83.3 in 1966, and has since declined. In 1985 the low birth weight ratio for the nation was 67.4. The ratio for the United States was above that for Michigan each year from 1960 through 1970. Since then the ratio for the nation has been the same or lower than that of Michigan.

Table 1.23
Low Weight[1] Live Births and Low Birth Weight Ratios by Level of Prenatal Care and Race of Child, Michigan Residents, 1986

LEVEL OF PRENATAL CARE (KESSNER INDEX[2])	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATIO[3]	NUMBER	RATIO[3]	NUMBER	RATIO[3]	NUMBER	RATIO[3]	NUMBER	RATIO[3]
Adequate	5,760	57.5	3,861	46.2	1,832	121.9	63	39.9	4	*
Intermediate	2,382	89.4	1,432	72.3	911	145.6	38	67.6	1	*
Inadequate	1,024	125.8	515	91.3	496	215.2	13	71.4	-	-
Unknown	371	137.3	230	107.5	134	274.0	6	101.7	1	*
Total	9,537	69.3	6,038	54.3	3,373	140.1	120	50.4	6	117.6

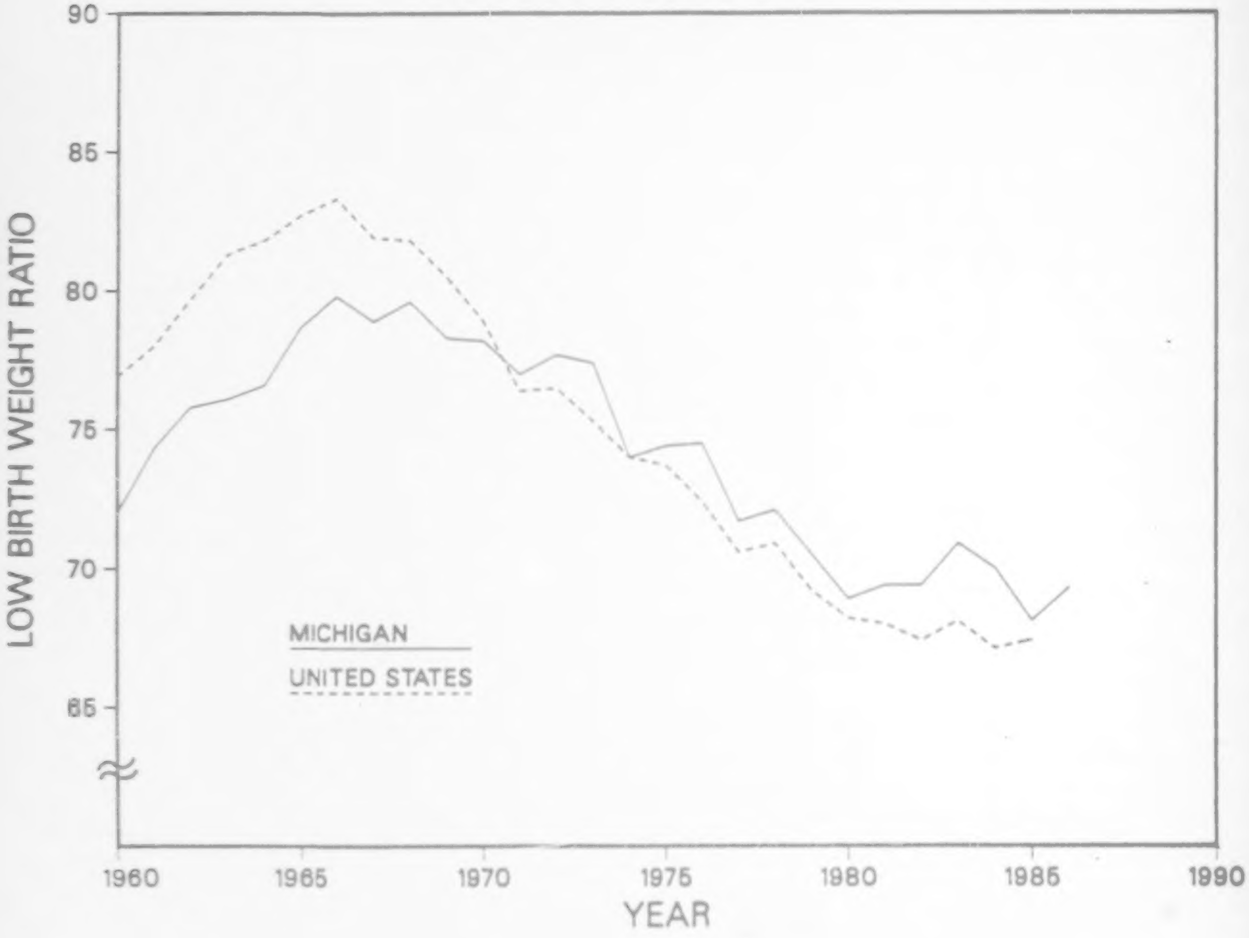
[1] Less than 2500 grams.

[2] The Kessner Index is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

[3] Ratio denominators obtained from Table 1.19.

FIGURE 1.7

LOW BIRTH WEIGHT[1] RATIO, MICHIGAN AND UNITED STATES[2] RESIDENTS, 1960-1986



[1] Prior to 1984, low birth weight was defined as 2500 grams or less. Starting with data year 1984, low birth weight is defined as less than 2500 grams in order to conform to national standards.

[2] United States ratio for 1986 is provisional.

SEX OF INFANT

In 1986 51.3 percent of the infants born to Michigan residents were male. The proportion of males to females varies by race. The numbers of males per 1,000 females were 1,058 for white infants, 1,028 for black infants, 1,164 for American Indians, and 1,116 for infants of all other races (Table 1.24). For all races the low birth weight ratio for females was higher than for males. The ratio of 73.8 for females of all races was 13.5 percent above the corresponding ratio of 65.0 for males.

MOTHER'S EDUCATION

Educational attainment of women having live births in 1986 varied with their age (Table 1.25). Of all Michigan resident live births in 1986, 19.2 percent were to women who had not completed high school. The majority (62.6 percent) of mothers aged less than 20 had not completed high school. The percentage of mothers with fewer than 4 years of high school dropped to 21.9 for those aged 20-24 and to 6.8 for mothers aged 30-34. This percent increased to 8.7 for mothers aged 35-39 and to 16.6 for mothers 40 years or older. Conversely, age of mother varied with the level of education. The median age of the mother was 21 years for those with 1 to 3 years of high school and 30 years for women with 4 or more years of college.

Birth order varies with the mother's education as well as her age (Table 1.26). The first birth ratio (number of first live births per 100 live births) generally decreased with increasing maternal age. Within maternal age categories the ratio increased with educational attainment. The first birth ratio for mothers with 4 or more years of college was 43.0 compared to 37.1 for mothers with 8 or fewer years of education.

For live births to women 20-24 years of age who had completed 4 or more years of college, 82.8 percent were to women with no previous live births, while only 21.6 percent of the live births to women of the same age who had completed the eighth grade or less were first births. Mothers with 1 to 3 years of high school had the lowest or second lowest first birth ratio within each age interval taken separately but the second highest total first birth ratio (41.8). This high overall ratio reflects the fact that a relatively large proportion of births to mothers with 1 to 3 years of high school occurred before the age of 20.

CONGENITAL ANOMALIES

One or more congenital anomalies were reported for 875 of the 137,626 resident live births in 1986 (Table 1.27). This translates to a rate of 63.6 per 10,000 live births.

In 1979 the 9th Revision of the International Classification of Diseases was introduced for the coding of reported congenital anomalies. Care should be exercised in making comparisons between the reported incidences of specific types of anomalies for years during which different revisions of the ICD were used to classify anomalies. In addition, the frequency of reporting of specific anomalies is affected by the reporting schedule. Many conditions may not be apparent at the time the birth certificate is completed and filed.

The most frequently reported category was ICD 755, other congenital anomalies of limbs

Table 1.24
Live Births, Low Weight Live Births, and Low Birth Weight Ratios, by Sex and Race, Michigan Residents, 1986

Race	Live Births				Low Weight Live Births			Low Birth Weight Ratios		
	Total[1]	Male	Female	Males per 1,000 Females	Total[1]	Male	Female	Total[1]	Male	Female
Total	137,626	70,616	67,004	1,054	9,537	4,589	4,943	69.3	65.0	73.8
White	111,115	57,128	53,983	1,058	6,038	2,958	3,076	54.3	51.8	57.0
Black	24,078	12,204	11,873	1,028	3,373	1,573	1,799	140.1	128.9	151.5
American Indian	753	405	348	1,164	34	13	21	45.2	32.1	60.3
Other	1,629	859	770	1,116	86	42	44	52.8	48.9	57.1
Unknown	51	20	30	667	6	3	3	117.6	*	*

[1] Records with sex not stated are included only in total columns.

Table 1.25
Live Births by Age and Education of Mother,
Michigan Residents, 1986

AGE OF MOTHER	MOTHER'S EDUCATION							PERCENT WITH AT LEAST HIGH SCHOOL EDUCATION
	TOTAL	8TH GRADE OR LESS	1-3 YEARS HIGH SCHOOL	4 YEARS HIGH SCHOOL	1-3 YEARS COLLEGE	4 OR MORE YEARS COLLEGE	NOT STATED	
Under 20 Years	16,871	1,075	9,489	5,707	538	2	60	37.0
20-24 Years	39,611	685	7,997	21,364	8,215	1,239	111	77.8
25-29 Years	46,421	505	4,120	21,451	12,659	7,574	112	90.0
30-34 Years	26,331	318	1,462	9,484	7,281	7,714	72	93.0
35-39 Years	7,503	201	452	2,286	1,838	2,701	25	91.0
40 or More Years	877	57	89	299	173	250	9	82.3
Not Stated	12	0	1	1	3	0	7	33.3
Total	137,626	2,841	23,610	60,592	30,707	19,480	396	80.5
Median Age at Last Birthday	26	22	21	25	27	30	25	000

Table 1.26
First Birth Ratios[1] by Age and Education of Mother, Michigan Residents, 1986

AGE OF MOTHER	MOTHER'S EDUCATION					
	TOTAL	8TH GRADE OR LESS	1 - 3 YEARS HIGH SCHOOL	4 YEARS HIGH SCHOOL	1 - 3 YEARS COLLEGE	4 OR MORE YEARS COLLEGE
Under 20 Years	80.2	76.2	77.1	85.0	92.8	*
20 - 24 Years	49.0	21.6	25.2	50.9	64.8	82.8
25 - 29 Years	33.6	11.1	10.5	27.9	38.1	56.3
30 - 34 Years	22.0	6.3	6.3	17.7	21.0	32.0
35 or More Years	15.2	3.9	3.9	12.2	14.4	21.4
Total	40.4	37.1	41.8	39.1	40.6	43.0

[1] First live births per 100 live births. Births where the Mother's age and/or education are not stated are included in the total but are not reallocated to specific age and education categoiries.

(excluding those classified to 754), with 175 anomalies. When this category was combined with the category 754, certain congenital musculoskeletal deformities (including clubfoot), and category 756, other congenital musculoskeletal anomalies, the total number of musculoskeletal system anomalies reported increased to 355, or 40.6 percent of all the 875 anomalies reported.

Congenital anomaly rates by age of mother and race of child are presented in Table 1.28. The rates for all races combined varied with the age of the mother. The lowest rates were experienced by mothers 25-39 years of age. The rates increase as age decreased below 25 years of age and increased with age above 39 years. Congenital anomaly rates for black infants were above those for white infants for women above 25 years of age. The overall rate for white infants was 62.3 compared to 73.1 for black infants

Figure 1.8 displays the rate of reported congenital anomalies for Michigan resident live births over the period 1960-1986. The rate has exhibited a cyclical pattern over this time period rising from 88.4 per 10,000 live births in 1960 to 120.6 in 1963. By 1970 the rate had returned to the level of 1960 (88.3). The rate then rose to 100.8 in 1973. Since 1973 the rate has declined by 37.0 percent. The rate of 63.5 for 1986 was the lowest reported congenital anomalies rate during the 27 year period.

Table 1.27

Congenital Anomalies[1] Reported by Type of Anomaly, Michigan Residents, 1986

TYPE OF ANOMALY	ICD[3] NUMBER	NUMBER OF CONDITIONS[4]	RATE PER 10,000 LIVE BIRTHS
Other congenital anomalies of limbs	755	175	12.7
Certain congenital musculoskeletal deformities	754	128	9.3
Congenital anomalies of genital organs	752	110	8.0
Congenital anomalies of the integument	757	85	6.2
Cleft palate and cleft lip	749	81	5.9
Chromosomal anomalies	758	59	4.3
Other congenital musculoskeletal anomalies	756	52	3.8
Other and unspecified congenital anomalies	759	41	3.0
Spina bifida	741	38	2.8
Other congenital anomalies of the heart	746	37	2.7
Congenital anomalies of urinary system	753	37	2.7
Congenital anomalies of ear, face, and neck	744	35	2.5
Other congenital anomalies of nervous system	742	33	2.4
Other congenital anomalies of upper alimentary tract	750	32	2.3
Other congenital anomalies of digestive system	751	26	1.9
Other congenital anomalies of circulatory system	747	24	1.7
Congenital anomalies of respiratory system	748	22	1.6
Anencephalus and similar anomalies	740	21	1.5
Congenital anomalies of eye	743	15	1.1
Bulbus cordis anomalies and anomalies of cardiac septal closure	745	7	0.5
At Least One Anomaly[2]		875	63.6

[1] Indicates anomalies apparent soon after a live birth.

[2] Does not equal the sum of anomalies specified because of multiple anomaly occurrences.

[3] Ninth Revision International Classification of Diseases, WHO.

[4] Includes three digit duplicates if fourth digit is different, permitting total counting of distinct conditions.

Table 1.28
Live Births With Congenital Anomalies Reported and Congenital Anomaly Rates[1] by Age of Mother and Race of Child, Michigan Residents, 1986

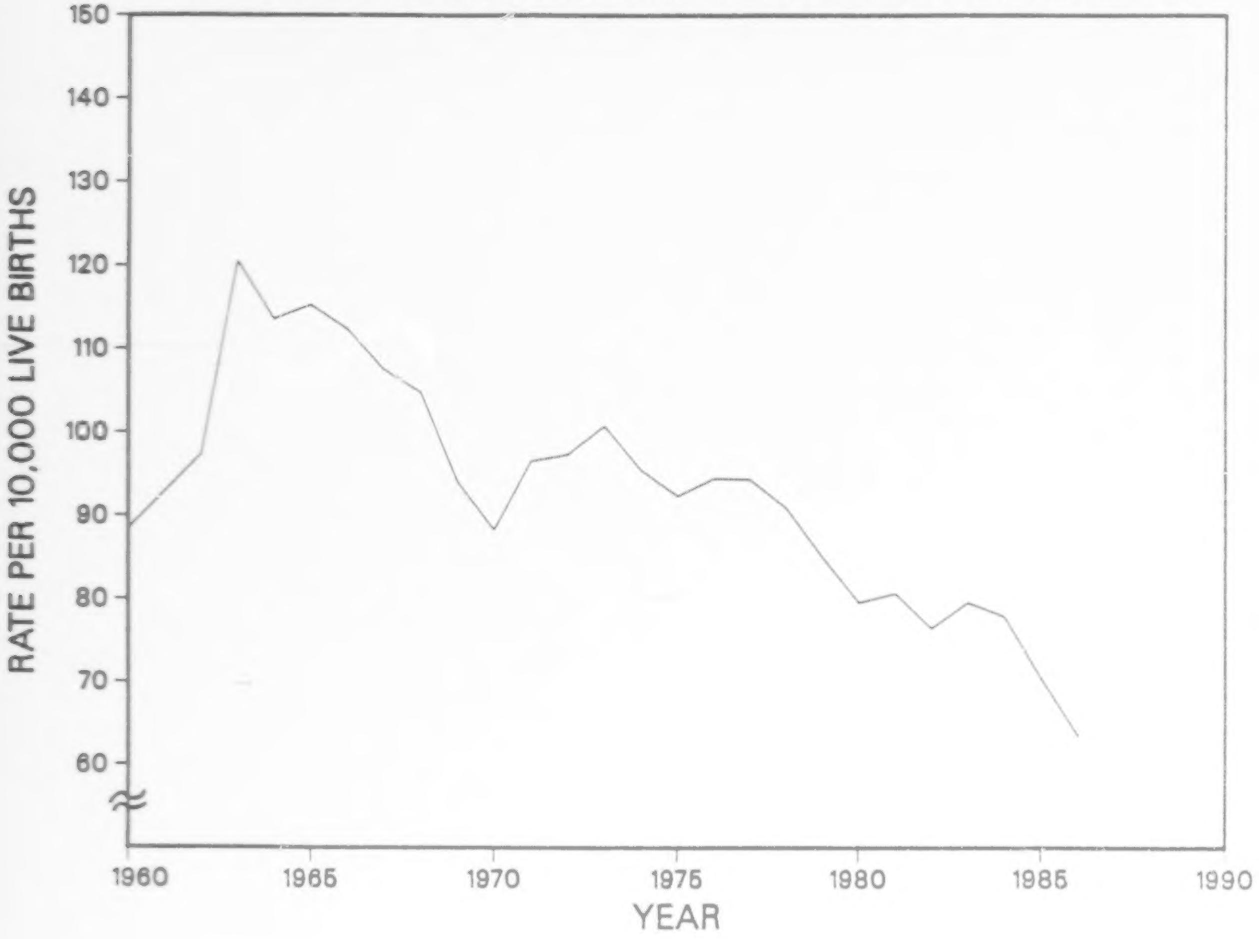
AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
Under 15 Years	2	*	-	-	2	*	-	-	-	-
15-19 Years...............	129	78.0	84	78.1	43	77.2	2	*	-	-
20-24 Years...............	258	65.1	210	66.6	46	61.1	2	*	-	-
25-29 Years...............	273	58.8	221	55.9	50	82.2	2	*	-	-
30-34 Years...............	155	58.9	132	59.0	22	65.1	1	*	-	-
35-39 Years...............	43	57.3	33	53.6	10	89.0	-	-	-	-
40 Years or Over..........	15	171.0	12	174.2	3	*	-	-	-	-
Total.....................	875	63.6	692	62.3	176	73.1	7	29.4	-	-
Median Age at Last Birthday..................	25	000	25	000	24	000	23	000	000	000

---

[1] Number of live births with congenital anomalies reported per 10,000 live births.

[2] Rate denominator obtained from Table 1.6.

FIGURE 1.8
INCIDENCE OF CONGENITAL ANOMALIES REPORTED PER 10,000 LIVE BIRTHS, MICHIGAN RESIDENTS, 1960-1986



COMPLICATIONS

The numbers of deliveries with specific types of complications reported in 1986 are shown in Table 1.29. These data represent entries in three boxes on the live birth certificate: complications of pregnancy, concurrent illnesses or conditions affecting this pregnancy, and complications of labor and/or delivery. It is important to note that these items are underreported on the birth certificate. Some conditions or procedures, such as obstetrical operations, may be routinely performed by some physicians, and hence not be considered complications.

In addition to valid complications there are also inappropriate terms entered, such as "prematurity", "spontaneous delivery" or "home delivery". These inappropriate terms were omitted in the tabulations of complications shown in Tables 1.29 and 1.30. The total number of deliveries with one or more valid complications was 40,837. This was a rate of 29.7 per 100 live births.

It should be noted that in some cases the code used to describe the complication is dependent on the box in which the entry is found, while in other cases the same code is given regardless of the box used. An example of the latter situation is chronic hypertension, which is shown in Table 1.29 under the heading "Concurrent illnesses or conditions affecting this pregnancy" regardless of the box in which it was entered on the birth certificate.

Thus, there were 9,088 deliveries (660.3 per 10,000 live births) with one or more entries which were coded to the various categories under the heading "Concurrent illnesses or conditions affecting this pregnancy", while the number of births with one or more entries in the box bearing this title on the birth certificate was only 6,160 (447.6 per 10,000 live births). This latter figure was more comparable to the rate of 427.8 reported for 1978, as prior to 1979 specific types of complications were not coded and tabulated. Rates presented for "Concurrent illnesses or conditions affecting this pregnancy", "Complications of pregnancy", and "Complications of labor and/or delivery" were derived from the numbers of records with entries in these boxes.

Among the most commonly reported maternal conditions not directly related to the pregnancy were chronic hypertensive disease, diabetes mellitus, and previous Cesarean sections, which were reported 1,655, 1,390 and 2,619 times, respectively, in 1986. Toxemia of pregnancy was reported for 2,169 deliveries (157.6 per 10,000). The most common form was pre-eclampsia of pregnancy, which was reported 113.9 times per 10,000 deliveries.

Various forms of difficult labor were reported in 7 percent of all live births. There were 1,336 deliveries complicated by conditions of the placenta and fetal membranes, and 3,566 by conditions of the umbilical cord. Premature rupture of membranes was reported for 2,747 deliveries. There were 21,112 deliveries reported as Cesarean sections. It should be noted that the type of delivery is not a question on the birth certificate, so that the rate of 1,534.0 Cesarean sections per 10,000 deliveries undoubtedly understated the true rate.

The distribution of deliveries with complications reported by age of mother and race of infant is shown in Table 1.30. The rates generally increased with mother's age. The

Table 1.29
Live Births with Specific Types of Complications Reported, Michigan Residents, 1986

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Concurrent illnesses or conditions affecting this pregnancy	9,088	660.3
Chronic circulatory and genitourinary diseases in mother	2,372	172.4
Chronic rheumatic heart disease	88	6.4
Chronic hypertensive disease	1,655	120.3
Other chronic diseases and congenital anomalies of heart and circulatory system	199	14.5
Chronic diseases of genitourinary system	464	33.7
Other maternal conditions	7,082	514.6
Syphilis	6	0.4
Gonorrhea and other VD, excluding syphilis	538	39.1
Diabetes mellitus	1,390	101.0
Influenza	28	2.0
Rubella	1	*
Injury	33	2.4
Prior operations (excluding previous cesarean section)	98	7.1
Previous cesarean section	2,619	190.3
Narcotic or drug user	371	27.0
Obesity	235	17.1
Hepatitis	26	1.9
Anemia	308	22.4
Pneumonia	37	2.7
Bronchitis	44	3.2
Emphysema	2	*
Epilepsy	60	4.4
Asthma	223	16.2
Alcohol Abuse	71	5.2
Overdose of Aspirin	-	-
All other maternal conditions	1,377	100.1
Unknown type of maternal condition	39	2.8
Toxemia of pregnancy	2,169	157.6
Hypertensive disease arising during pregnancy	46	3.3

Table 1.29 (continued)

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Pre-eclampsia of pregnancy	1,567	113.9
Eclampsia of pregnancy	23	1.7
Hyperemesis gravidarum	125	9.1
Toxemia superimposed on pre-existing hypertensive cardiovascular disease	106	7.7
Other and unspecified toxemia of pregnancy	491	35.7
Maternal ante- and intrapartum infection	695	50.5
Infections of genital tract	99	7.2
Pyelitis and pyelonephritis	43	3.1
Other infections of urinary tract	247	17.9
Infections of amniotic fluid	182	13.2
Other infections	144	10.5
Difficult labor with disproportion or abnormality of organs and tissues of the pelvis	3,895	283.0
Difficult labor with malposition of fetus	4,120	299.4
Breech presentation	2,933	213.1
Transverse presentation	237	17.2
Brow presentation	35	2.5
Face presentation	56	4.1
Compound or shoulder presentation	74	5.4
Other specified presentation	338	24.6
Unspecified presentation	477	34.7
Difficult labor with abnormality of forces of labor	831	60.4
Primary uterine inertia	188	13.7
Secondary uterine inertia	126	9.2
Prolonged second stage	162	11.8
Precipitate birth	295	21.4
Other and unspecified abnormality of forces of labor	69	5.0
Other and unspecified difficult labor	960	69.8
Laceration of pelvic organs	709	51.5
Conditions of placenta and fetal membranes	1,336	97.1

Table 1.29 (continued)

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Placenta previa - partial	376	27.3
Placenta previa - complete	47	3.4
Premature separation of placenta - partial	630	45.8
Premature separation of placenta - complete	3	*
Placental insufficiency	63	4.6
Delivery complicated by retained placenta	208	15.1
Other and unspecified abnormalities of placenta and fetal membranes	54	3.9
Conditions of umbilical cord	3,566	259.1
Other complications of pregnancy and childbirth	11,089	805.7
Incompetent cervix	198	14.4
Premature rupture of membranes	2,747	199.6
Hydramnios	137	10.0
Ectopic pregnancy	5	*
Abortion - any type	8	0.6
Destructive operation on live fetus to facilitate birth	2	*
Multiple pregnancy	1,492	108.4
Hemorrhage or threatened abortion	724	52.6
RH incompatibility	217	15.8
Anemia of pregnancy	170	12.4
All other complications of pregnancy and childbirth	6,161	447.7
Unknown type of complication of pregnancy and childbirth	34	2.5
Obstetrical operations	23,155	1,682.5
Antepartum obstetrical procedures	24	1.7
Operations inducing labor or assisting delivery	1,759	127.8
Cesarean section	21,112	1,534.0
Operations after delivery or abortion . .	1,499	108.9
At least one complication	40,837	2,967.2

[1] Sum of subcategories may not equal total for category due to the occurrences of multiple complications.

Table 1.30
Live Births with Complications Reported and Complication Rates[1] by Age of Mother and Race of Child, Michigan Residents, 1986

AGE OF MOTHER	RACE OF CHILD									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
Under 15 Years . .	88	26.3	19	21.1	67	27.7	2	*	-	-
15-19 Years . . .	4,646	28.1	3,011	28.0	1,575	28.3	54	26.2	6	66.7
20-24 Years . . .	11,561	29.2	9,177	29.1	2,240	29.8	142	25.8	2	*
25-29 Years . . .	13,519	29.1	11,250	28.5	2,055	33.8	212	26.6	2	*
30-34 Years . . .	8,081	30.7	6,635	29.7	1,259	37.3	186	32.2	1	*
35-39 Years . . .	2,603	34.7	2,046	33.2	468	41.6	87	40.3	2	*
40 Years or Over .	335	38.2	245	35.6	81	53.3	9	26.5	-	-
Unknown	4	*	3	*	1	*	-	-	-	-
Total	40,837	29.7	32,386	29.1	7,746	32.2	692	29.1	13	25.5
Median Age at Last Birthday	26	000	26	000	24	000	28	000	21	000

[1] Number of live births with complications reported per 100 live births.
[2] Rate denominators obtained from Table 1.6.

rate increased from 26.3 percent for mothers under 15 years of age to 38.2 percent for mothers 40 years or over. The median age of mothers for births with complications reported was 26 years, the same as the median age for all live births.

Similar patterns of variation by age of mother was observed for white and black infants. The rate for black infants was higher than for white infants in all age groups. Overall the rate for black infants was about 10.7 percent higher than the rate for white infants (32.2 compared to 29.1).

PLACE OF OCCURRENCE

Of some confusion to persons not familiar with vital records data is the difference between occurrence and residence figures. Information on events to residents of Michigan that occur throughout the country and, in some instances, outside United States boundaries is collected in order to obtain the full scope of activity for the state population.

In 1986 1,929 Michigan resident live births occurred outside the state. Information on these events was forwarded to the state of Michigan for statistical purposes only. While only 1.4 percent of the total for the state was involved, statistics for the counties on Michigan's southern and northwestern borders would be strongly affected were this information not available.

Table 1.31 shows that births in the three border states and Canada comprise 88.6 percent of all resident live births that occurred out of state. Live births to Michigan residents oc-

Table 1.31
Michigan Resident Live Births Occurring Outside of Michigan
by Place of Occurrence, and Live
Births Occurring in Michigan
to Non-Michigan Residents by Place of Residence, 1986

GEOGRAPHIC AREA	LIVE BIRTHS TO RESIDENTS OCCURRING OUTSIDE MICHIGAN		LIVE BIRTHS TO NONRESIDENTS OCCURRING IN MICHIGAN	
	NUMBER	PERCENT	NUMBER	PERCENT
Total	1,929	100.0	517	100.0
Florida	11	0.6	32	6.2
Illinois	22	1.1	16	3.1
Indiana	532	27.6	91	17.6
Ohio	822	42.6	61	11.8
Texas	13	0.7	48	9.3
Wisconsin	348	18.0	185	35.8
Canada	8	0.4	10	1.9
Other Areas	173	9.0	74	14.3

curred in 42 of the 50 states and in the District of Columbia in 1986.

The number of nonresident live births that occurred in Michigan in 1986 was 517. Information about those events was shared with the appropriate states by the State of Michigan under specific confidentiality guidelines so they might have a complete statistical file on their residents. Births in the four border areas comprised 67.1 percent of these events, as shown in Table 1.31. There were live births in Michigan to residents of 33 states, the Virgin Islands and at least 4 foreign countries.

PLACE OF BIRTH

In 1986, 99.3 percent of the 136,214 infants born in Michigan were delivered in hospitals. There were 733 infants born at home, and 173 other non-hospital deliveries (Table 1.32). While the percentage of infants not born in hospitals was still very small, the number of home deliveries and other out-of-hospital births has increased in recent years. Between 1973 and 1982 the number of infants born at home increased by 151 percent. The proportion of all live-born infants who were delivered at home increased from 0.20 percent

Table 1.32
Live Births by Place of Delivery
Michigan Occurrences, 1976 - 1986

YEAR	TOTAL	PLACE OF DELIVERY					
		HOSPITAL		HOME		OTHER AND UNKNOWN	
		NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
1975	132,777	132,354	99.68	313	0.24	110	0.08
1976	130,253	129,714	99.59	375	0.29	164	0.13
1977	137,140	136,503	99.54	489	0.36	148	0.11
1978	137,896	137,119	99.44	573	0.42	204	0.15
1979	143,240	142,437	99.44	619	0.43	184	0.13
1980	144,077	143,257	99.43	645	0.45	175	0.12
1981	139,415	138,604	99.42	646	0.46	165	0.12
1982	137,127	136,236	99.35	707	0.52	184	0.13
1983	131,838	131,010	99.37	670	0.51	158	0.12
1984	134,847	134,042	99.40	646	0.48	159	0.12
1985	136,764	135,942	99.40	620	0.45	202	0.15
1986	136,214	135,308	99.33	733	0.54	173	0.13

[1] Does not include births in hospitals without a maternity ward.

in 1973 to 0.52 percent in 1982 (160 percent increase). The number of home births decreased for the three years between 1982 and 1985, then increased again in 1986.

ATTENDANT AT BIRTH

Data in Table 1.33 reveal that 98.8 percent of the live births which occurred in Michigan were attended by a physician, either an M.D. or D.O. There were 199 live births attended by the mother's husband, while nurses delivered 108 infants. Midwives and nurse-midwives delivered 903 infants. During 1986 there were 91 infants born to unattended women.

Of the 733 infants born in the mother's home, only 9.0 percent were attended by a physician while 24.4 percent were attended by the husband and 40.7 by midwives and nurse-midwives.

Table 1.33
Live Births by Place of Delivery and Type of Attendant, Michigan Occurrences, 1986

ATTENDANT	PLACE OF DELIVERY							
	TOTAL		HOSPITAL[1]		HOME		OTHER AND UNKNOWN	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	136,214	100.0	135,308	100.0	733	100.0	173	100.0
Physician, M.D.	116,118	85.2	115,999	85.7	55	7.5	64	37.0
Physician, D.O.	18,593	13.6	18,559	13.7	11	1.5	23	13.3
Husband	199	0.1	3	0.0	179	24.4	17	9.8
Nurse	108	0.1	100	0.1	6	0.8	2	1.2
Midwife	303	0.2	7	0.0	280	38.2	16	9.2
Physician's Asst.	17	0.0	17	0.0	-	0.0	-	0.0
Nurse-Midwife[2]	600	0.4	582	0.4	18	2.5	-	0.0
Other	158	0.1	13	0.0	109	14.9	36	20.8
Unattended	91	0.1	3	0.0	73	10.0	15	8.7
Unknown	27	0.0	25	0.0	2	0.3	-	0.0

[1] Does not include births in hospitals without a maternity ward.

[2] May or may not be certified by the American College of Nurse Midwives.

FETAL DEATHS

There were 1,325 fetal deaths reported in 1900. The number of reported fetal deaths increased from 1900 through 1916 and by 1916 3,689 were reported (Figure 1.9 and Table 4.1). The numbers of deaths were relatively stable from 1916 through 1930, with the peak year for the period being 1927. This year marked the highest frequency of occurrence in this century with 3,834 fetal deaths. Over the period 1930 through 1939, fetal deaths declined to 2,572 fetal deaths then increased through 1943, decreased in 1944 and 1945, and increased again to 3,422 in 1947. Fetal deaths numbered between about 3,000 and 3,250 in the period 1948 to 1958. In the 1960's and 70's the number of reported fetal deaths declined sharply. By 1976, the number fell to 1,264, a new low for this century. After a slight increase in 1977 (1,284) new lows have been recorded in each of the following seven years. The number of Michigan resident fetal deaths was 929 in 1984. By 1986 the number decreased to 865 resident fetal deaths.

The fetal death ratio for Michigan has declined through most of the twentieth century (Figure 1.10 and Table 4.2). The ratio rose from 30.3 in 1900 to 43.5 fetal deaths per 1,000 live births in 1905. Through the teens and early twenties, this ratio fluctuated between 38.0 and 42.4, never reaching the peak ratio observed in 1905. In 1922, Michigan's fetal death ratio was 42.0, marking a turning point, as fetal death ratios have generally declined since that year. The low ratio of 1900 was first succeeded by a new low ratio in 1936 (29.7). Over the next 50 years, new lows were established repeatedly, as the fetal death ratio continued to decline. The ratio in 1986 was 6.3, the lowest observed in this century.

National fetal death data are presented in Figure 1.10 and Table 1.34. Michigan's fetal death ratios have generally been below national ratios. In fact, the United States ratio has been below that for Michigan in only nine of the 64 years for which national data are available. The last time the United States ratio was below the Michigan ratio was in 1950. In 1985, the Michigan ratio of 6.9 was 11.5 percent below the national ratio of 7.9. It should be noted that fetal deaths in Michigan are comprised of infants born dead who had passed through 20 weeks gestation or weighed 400 grams or more. This definition is different from that of most states.

CAUSES OF FETAL DEATH

A classification of fetal deaths by underlying cause of death is contained in Table 1.35. This classification is based on the 9th Revision of the International Classification of Diseases which was introduced in 1979. Since major changes were made between the 8th and 9th revisions of the ICD in the section used for classifying causes of fetal death, comparisons between cause-specific ratios for 1979 and later years and those for years prior to 1979 require detailed study. Also, since a relatively large number of deaths are allocated to unspecified causes, caution should be exercised in attempting to draw specific inferences regarding causes of death.

In 1986, 348 of the total 865 deaths were assigned to the category of "other and ill-defined conditions originating in the perinatal period". Over half (52.0 percent) of the remaining fetal

FIGURE 1.9
FETAL DEATHS, MICHIGAN RESIDENTS, 1900-1986

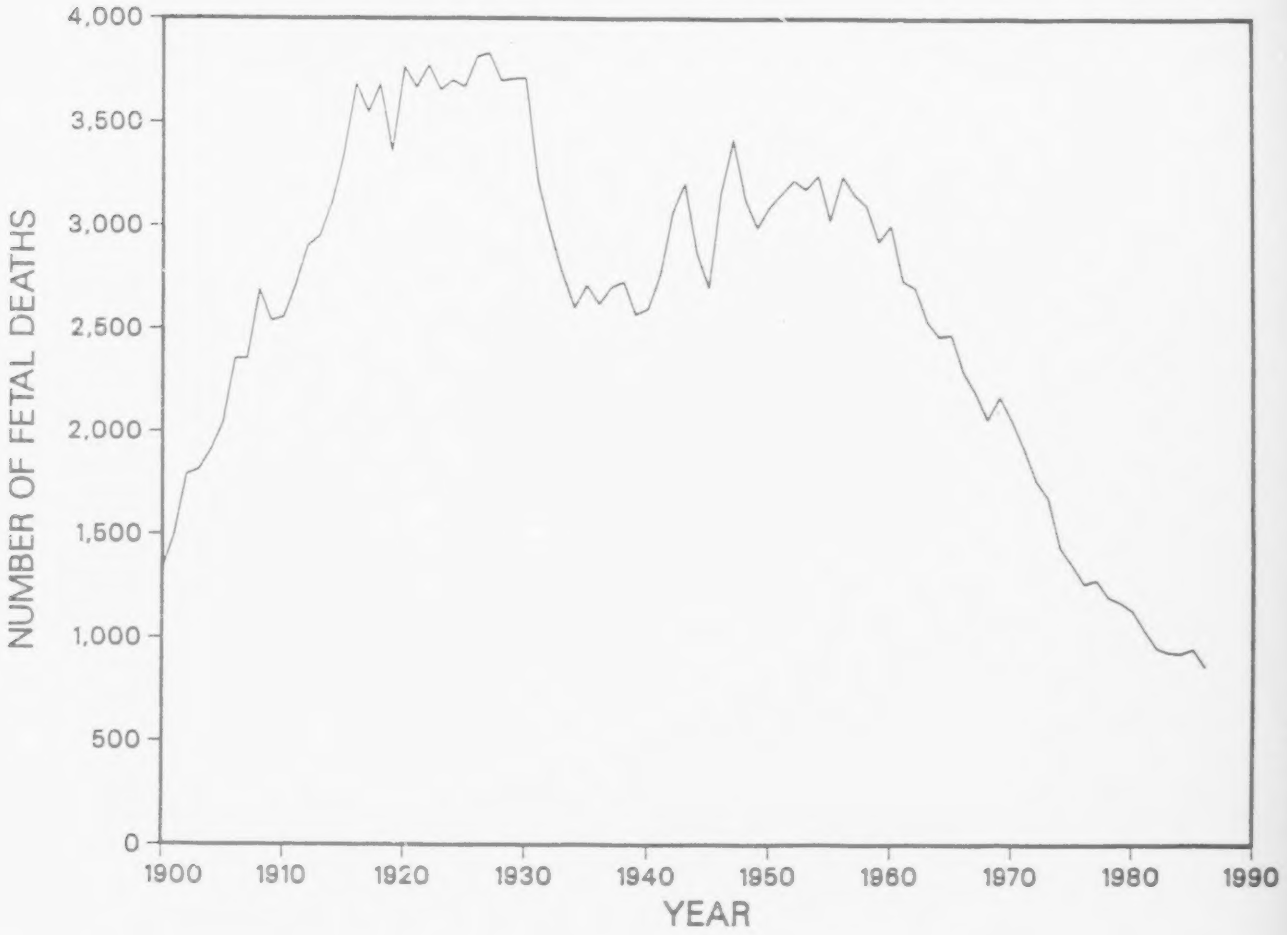
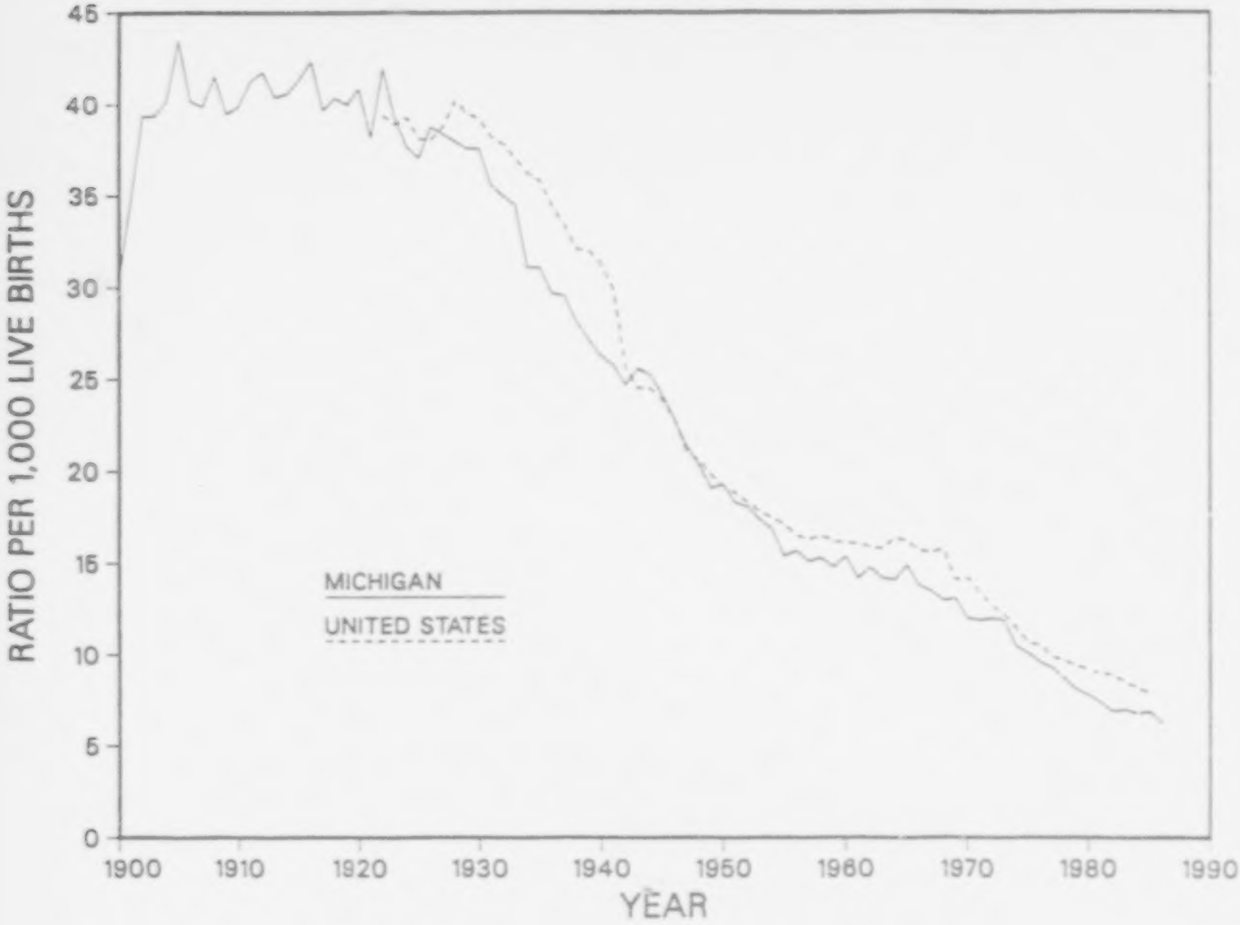


FIGURE 1.10
FETAL DEATH RATIOS,[1] MICHIGAN RESIDENTS, 1900-1986, AND UNITED STATES RESIDENTS, 1922-1985



[1] U.S. ratios prior to 1933 are for registration areas only. U.S. ratios are based on three different definitions of fetal death:

1) prior to 1942 - all reported fetal deaths regardless of period of gestation
2) 1942-1968 - fetal deaths with gestational age 20 weeks or more or not stated
3) 1969-current - fetal deaths of stated or presumed period of gestation of 20 or more weeks

Table 1.34
Fetal Deaths and Fetal Death Ratios, Michigan and United States Residents, 1900-1986

UNITED STATES		YEAR	MICHIGAN	
FETAL DEATHS	FETAL DEATH RATIOS		FETAL DEATHS	FETAL DEATH RATIOS
---	---	1900	1,325	30.3
---	---	1910	2,559	39.9
70,010[1]	39.4	1920	3,770	40.9
86,466	39.2	1930	3,714	37.6
73,802	31.3	1940	2,602	26.3
68,262	19.2	1950	3,095	19.3
68,480	16.1	1960	3,008	15.4
52,961	14.2	1970	2,060	12.0
47,818	13.4	1971	1,923	11.9
41,380	12.7	1972	1,765	12.0
38,309	12.2	1973	1,682	11.9
36,281	11.5	1974	1,438	10.5
33,796	10.7	1975	1,356	10.1
33,111	10.5	1976	1,264	9.6
33,053	9.9	1977	1,284	9.3
32,301	9.7	1978	1,201	8.7
32,969	9.4	1979	1,175	8.1
33,353	9.2	1980	1,135	7.8
32,596	9.0	1981	1,040	7.4
32,694	8.9	1982	954	6.9
30,752	8.5	1983	933	7.0
30,099	8.2	1984	929	6.8
29,661	7.9	1985	953	6.9
N.A.	N.A	1986	865	6.3

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[1] Data for 1922.

Table 1.35
Fetal Deaths and Fetal Death Ratios by Underlying Cause of Death, Michigan Residents, 1986

ICD No.[1]	CAUSE OF DEATH	FREQUENCY	RATIO[2]
740	Anencephalus and similar anomalies	12	8.7
741	Spina bifida	2	1.5
742	Other congenital anomalies of nervous system	8	5.8
745	Bulbus cordis anomalies and anomalies of cardiac septal closure	1	0.7
746	Other congenital anomalies of heart	3	2.2
753	Congenital anomalies of urinary system	2	1.5
757	Congenital anomalies of the integument	1	0.7
758	Chromosomal anomalies	2	1.5
759	Other and unspecified congenital anomalies	22	16.0
740-759	All congenital anomalies combined	53	38.5
760	Fetus or newborn affected by maternal conditions which may be unrelated to present pregnancy	23	16.7
761	Fetus or newborn affected by maternal complications of pregnancy	90	65.4
762	Fetus or newborn affected by complications of placenta, cord, and membranes	269	195.5
763	Fetus or newborn affected by other complications of labor and delivery	5	3.6
764	Slow fetal growth and fetal malnutrition	3	2.2
765	Disorders relating to short gestation and unspecified low birthweight	30	21.8
766	Disorders relating to long gestation and high birthweight	1	0.7
767	Birth trauma	1	0.7
768	Intrauterine hypoxia and birth asphyxia	23	16.7
770	Other respiratory conditions of fetus and newborn	2	1.5
772	Fetal and neonatal hemorrhage	2	1.5
773	Hemolytic disease of fetus or newborn, due to isoimmunization	4	2.9
775	Endocrine and metabolic disturbances specific to the fetus and newborn	4	2.9
778	Conditions involving the integument and temperature regulation of fetus and newborn	7	5.1
779	Other and ill-defined conditions originating in the perinatal period	348	252.9
740-779	All Causes	865	628.5

[1] Ninth Revision of the International Classification of Diseases, WHO.

[2] Ratios per 100,000 resident live births.

deaths for which a cause was stated were attributed to complications of placenta, cord, and membranes (ICD 762). This is a group of maternal conditions which includes placenta previa, premature separation of the placenta, placental hemorrhage, and compression of the umbilical cord. Second in frequency was the category maternal complications of pregnancy (ICD 761), which was listed as the cause of 90 fetal deaths. This includes such complications as premature rupture of membranes, multiple pregnancy, and incompetent cervix. An additional 23 fetal deaths were caused by maternal conditions which may be unrelated to the pregnancy. There were 53 fetal deaths caused by congenital anomalies in 1986.

AGE OF MOTHER AND RACE OF FETUS

It appears that the younger and older mothers and mothers of black fetuses have a greater risk of delivering a stillborn fetus (Table 1.36). The rates of fetal loss for mothers under 20 years of age and 30 years of age or greater are higher than those for mothers 20 to 29 years of age. The rate for mothers of fetuses of races other than white and black is slightly lower than the rate for mothers of white fetuses. The rate for mothers of black fetuses was 2.3 times higher than the rate for mothers of white fetuses.

The overall fetal death rate per 1,000 total births (live births plus fetal deaths) was 6.2 in 1986. An association of maternal age with fetal death rates is apparent from Table 1.36. The 20-24 and 25-29 year age groups displayed the lowest rates. Progressively older and younger age groups displayed increasingly higher rates. The rate for women 15-19 (7.8) was 41.8 percent higher than the rate for women 20-24 years of age (5.5). The highest rate was experienced by women over 40, for whom the rate (15.7) was 2.9 times the rate for women in the lowest risk age group. The median age of women whose pregnancy resulted in a fetal death was 26 years, the same as the median age for women having live births.

In 1986 the fetal death rate for white fetuses was 4.9 while the fetal death rate for mothers of black fetuses was 2.3 times higher at 11.2. Rates for black fetuses were higher than for white fetuses in all age intervals with sufficient events to calculate rates. The differentials ranged from 1.7 times higher for women aged 30 through 39 to 2.7 times higher for women aged 25 through 29.

INTERPREGNANCY TIME PERIOD FOR FETAL DEATHS

For those women whose pregnancy terminated with a fetal death in 1986, a total of 383 reported the date of the termination of a previous pregnancy. Table 1.37 presents a comparison of fetal death rates by interpregnancy time span for births in 1986 to women who reported the date of a prior termination. Minimum risk was associated with spacings of between 2 and 3 years (3.3 fetal deaths per 1,000 total births). Risk increased progressively as the length of spacings decreased or increased. The fetal death rate for births with spacings of five or more years was 36.4 percent above the rate of the risk with spacing between 2 and 3 years. The greatest risk of fetal death was associated with spacings of less than one year. For births in this category the fetal death rate (8.3) was twice the rate

Table 1.36
Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Age of Mother and Race of Fetus, Michigan Residents, 1986

AGE OF MOTHER AND RACE OF FETUS	FETAL DEATHS	LIVE BIRTHS	TOTAL BIRTHS	RATE PER 1,000 TOTAL BIRTHS
Under 15 Years	2	335	337	*
White	-	90	90	-
Black	2	242	244	*
All Other Races	-	3	3	-
Not Stated	-	-	-	-
15-19 Years	130	16,536	16,666	7.8
White	65	10,753	10,818	6.0
Black	64	5,568	5,632	11.4
All Other Races	-	206	206	-
Not Stated	1	9	10	*
20-24 Years	221	39,611	39,832	5.5
White	137	31,525	31,662	4.3
Black	79	7,525	7,504	10.4
All Other Races	1	550	551	*
Not Stated	4	11	15	*
25-29 Years	263	46,421	46,684	5.6
White	177	39,527	39,704	4.5
Black	76	6,086	6,162	12.3
All Other Races	4	796	800	*
Not Stated	6	12	18	333.0
30-39 Years	203	33,834	34,037	6.0
White	154	28,522	28,676	5.4
Black	42	4,503	4,545	9.2
All Other Races	4	793	797	*
Not Stated	3	16	19	*
40 or Over	14	877	891	15.7
White	9	689	698	12.9
Black	5	152	157	*
All Other Races	-	34	34	-
Not Stated	-	2	2	-
Not Stated	32	12	44	727.3
White	3	9	12	*
Black	4	2	6	*
All Other Races	-	-	-	-
Not Stated	25	1	26	961.5
Total	865	137,626	138,491	6.2
White	545	111,115	111,660	4.9
Black	272	24,078	24,350	11.2
All Other Races	9	2,382	2,391	3.8
Not Stated	39	51	90	433.3

Table 1.37
Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Interpregnancy Time Span, Michigan Residents Reporting Prior Pregnancy Terminations[1], 1986[2]

TIME SPAN IN YEARS	FETAL DEATHS	LIVE BIRTHS	TOTAL BIRTHS	RATE PER 1,000 TOTAL BIRTHS
Total	383	91,357	91,740	4.2
Less Than One	27	3,239	3,266	8.3
1 < 2	121	28,591	28,712	4.2
2 < 3	72	21,758	21,830	3.3
3 < 5	87	20,936	21,023	4.1
5 or More	76	16,833	16,909	4.5

[1] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[2] The methodology for calculating interpregnancy time span was altered slightly in 1984. Hence, rates are not comparable to data from prior years.

with spacing between 1 and 2 years and 2.5 times the rate with spacing between 2 and 3 years.

When comparing interpregnancy time spans for live births and fetal deaths one should be aware that the shorter gestational period associated with fetal deaths results in a correspondingly shorter interpregnancy time span because span is measured from the date of last termination to date of current birth. However, the median interpregnancy time period for fetal deaths was 2 years and 6 months, which was the same as the median time period for women having live births in 1986 (Table 1.38).

As with live births (Table 1.13), the outcome of the immediate prior termination has a strong influence on the interval between pregnancies (Table 1.38). For women whose prior termination was a fetal death, the median interpregnancy time span was 2 years and 2 months. For 256 women whose prior termination was a live birth, the median interpregnancy time span was 2 years and 8 months.

Table 1.38

Fetal Deaths[1], to Women Reporting Prior Pregnancy Terminations[2] by Time Span[3] Between Last and Current Termination and by Whether Prior Termination Resulted in a Live Birth or a Fetal Death[4], Michigan Residents, 1986

TIME SPAN IN YEARS	TOTAL		PRIOR FETAL DEATH[4]		PRIOR LIVE BIRTH	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	383	100.0	127	100.0	256	100.0
Less Than One	27	77.0	14	11.0	13	5.1
1 < 2	121	31.6	46	36.2	75	29.3
2 < 3	72	18.8	19	15.0	53	20.7
3 < 5	87	22.7	22	17.3	65	25.4
5 or More . .	76	19.8	26	20.5	50	19.5
Median Time Span	2 years. 6 months		2 years. 6 months		2 years. 6 months	

[1] Deaths of fetuses of twenty or more weeks gestation or weighing 400 grams or more.

[2] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[3] The methodology for calculating interpregnancy time span was altered slightly in 1984. Hence, rates are not comparable to data from prior years.

[4] Fetal death as defined for the pregnancy history on the fetal death record is a fetal death of any gestational age.

PRENATAL CARE - FETAL DEATHS

Of the 865 fetal deaths reported for 1986, 41 or 4.7 percent of the reports indicated that the mother had no prenatal visits. The comparable percent for live births was 0.9. The percent of mothers with fewer than ten prenatal visits was 51.7 for fetal deaths and 20.6 for live births (Table 1.17 and Table 1.39).

The number of prenatal visits varied by race (Table 1.39). Mothers of white fetuses had a mean of 7.7 visits whereas those of black fetuses and fetuses of all other races reported means of 5.3 and 6.6 visits respectively. Note, however, that the number of prenatal visits was not stated on 13.9 percent of the reports for white fetuses and 43.8 percent of the reports for black fetuses.

Table 1.39
Fetal Deaths and Percent Distribution by Number of the Mother's Prenatal Visits and Race of Fetus, Michigan Residents, 1986

NUMBER OF PRENATAL VISITS	RACE OF FETUS									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
None	41	4.7	17	3.1	24	8.8	-	-	-	-
1-4	146	16.9	91	16.7	53	19.5	2	22.2	-	-
5-9	260	30.1	207	38.0	49	18.0	3	33.3	1	2.6
10-14	153	17.7	128	23.5	23	8.5	2	22.2	-	-
15-19	21	2.4	18	3.3	3	1.1	-	-	-	-
20 or Over	9	1.0	8	1.5	1	0.4	-	-	-	-
Not Stated	235	27.2	76	13.9	119	43.8	2	22.2	38	97.4
Total	865	100.0	545	100.0	272	100.0	9	100.0	39	100.0
Median Number of Visits	6	000	7	000	4	000	6	000	6	000
Mean Number of Visits	7.1	000	7.7	000	5.3	000	6.6	000	6.0	000

The fetal death rate varied with the number of prenatal visits (Table 1.40). The rate was 33.2 for mothers with no care, 42.9 for mothers with 1-4 visits, and 10.8 for those with 5-9 visits. The fetal death rate was low for mothers with 10-14 visits (1.8) and 15-19 visits (1.2) and increased to 2.5 for mothers with 20 or more visits.

Fetal death rates for white and black fetuses exhibited similar patterns of association with the number of prenatal visits (Table 1.40). Although the overall fetal death rate for black fetuses was 2.3 times higher than for white fetuses, the fetal death rate for black fetuses was 41.4 percent higher than the rate for white fetuses when the mother received no prenatal care and was similar when the mothers received prenatal care.

Caution should be exercised in interpreting the above fetal death rates and proportions. Incomplete reporting of the number of visits occurred on 27.2 percent of the fetal death reports compared with 1.9 percent of the live birth records. It should also be kept in mind that fetal deaths are much more likely to occur preterm and this affects the possible number of prenatal visits (Table 1.41). In 1986, 27.6 percent of the reported fetal deaths occurred before 28 weeks of gestational age, and 49.4 percent occurred before 36 weeks. Incomplete reporting of gestational age occurred on an additional 23.9 percent of the fetal death reports.

The month of pregnancy that prenatal care began was most frequently the second month (Table 1.42). The proportion of all fetal deaths in 1986 that were to women who reported receiving care prior to the fourth month of pregnancy was 55.5 with 66.7 percent receiving care prior to the sixth month.

From 1970 through 1973 there were increases in the percentage of fetal deaths in which the mother received care prior to the fourth and sixth month. These percentages declined between 1973 and 1976, and generally increased between 1976 and 1983 (Figure 1.11). Both percentages declined between 1983 and 1986. However the percentage of live births in which the mother received care prior to the fourth month increased between 1970 and 1985 to 81.0 percent then declined to 79.8 percent in 1986. The percentage of live births in which the mother received care prior to the sixth month increased to 93.9 percent in 1985 then declined to 93.3 in 1986.

The fetal death rate increased as the quality of prenatal care measured by the Kessner Index decreased. The rate was 3.6 per 1000 total births (fetal deaths and live births) born to women receiving adequate prenatal care (Table 1.43). The rate increased to 11.7 and 16.1 for births to women receiving intermediate and inadequate levels of care respectively. The fetal death rate was 8.6 percent higher for black births than for white births for women receiving an adequate level of care. This difference increased for women receiving less than adequate levels of care. The fetal death rates were 2.5 and 2.6 times higher for black births than for white births to women receiving intermediate and inadequate levels of care respectively.

The numbers of fetal deaths increased as the quality of prenatal care increased even though the fetal death rates decreased because most women receive adequate care (Table 1.44). The proportion of total births born to women receiving adequate care in 1986 was 72.8 percent while 41.6 percent of the fetal deaths were born to women with adequate prenatal care. Since the Kessner Index reduces the

Table 1.40
Fetal Deaths, Total Births and Fetal Death Rates by Number of Prenatal Visits and Race[1]
Michigan Residents, 1986

NUMBER OF VISITS	ALL BIRTHS			WHITE BIRTHS			BLACK BIRTHS			OTHER BIRTHS		
	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES
Total	665	138,491	6.2	545	111,660	4.9	272	24,350	11.2	9	2,391	3.8
None	41	1,236	33.2	17	607	28.0	24	606	39.6	-	19	-
1-4	146	3,401	42.9	91	2,098	43.4	53	1,209	43.8	2	92	*
5-9	260	24,121	10.8	207	18,793	11.0	49	4,809	10.2	3	511	*
10-14	153	85,757	1.8	128	71,457	1.8	23	12,891	0.8	2	1,392	*
15-19	21	17,429	1.2	18	13,374	1.3	3	3,767	*	-	281	-
20 or Over	9	3,642	2.5	8	3,027	2.6	1	570	*	-	45	-
Not Stated	235	2,905	80.9	76	2,304	33.0	119	498	239.0	2	51	*

[1] Race not stated included in total columns only.

FIGURE 1.11
PERCENT OF WOMEN HAVING FETAL DEATHS WHO RECEIVED CARE PRIOR TO THE 4TH MONTH AND THE 6TH MONTH OF PREGNANCY, MICHIGAN RESIDENTS, 1970-1986

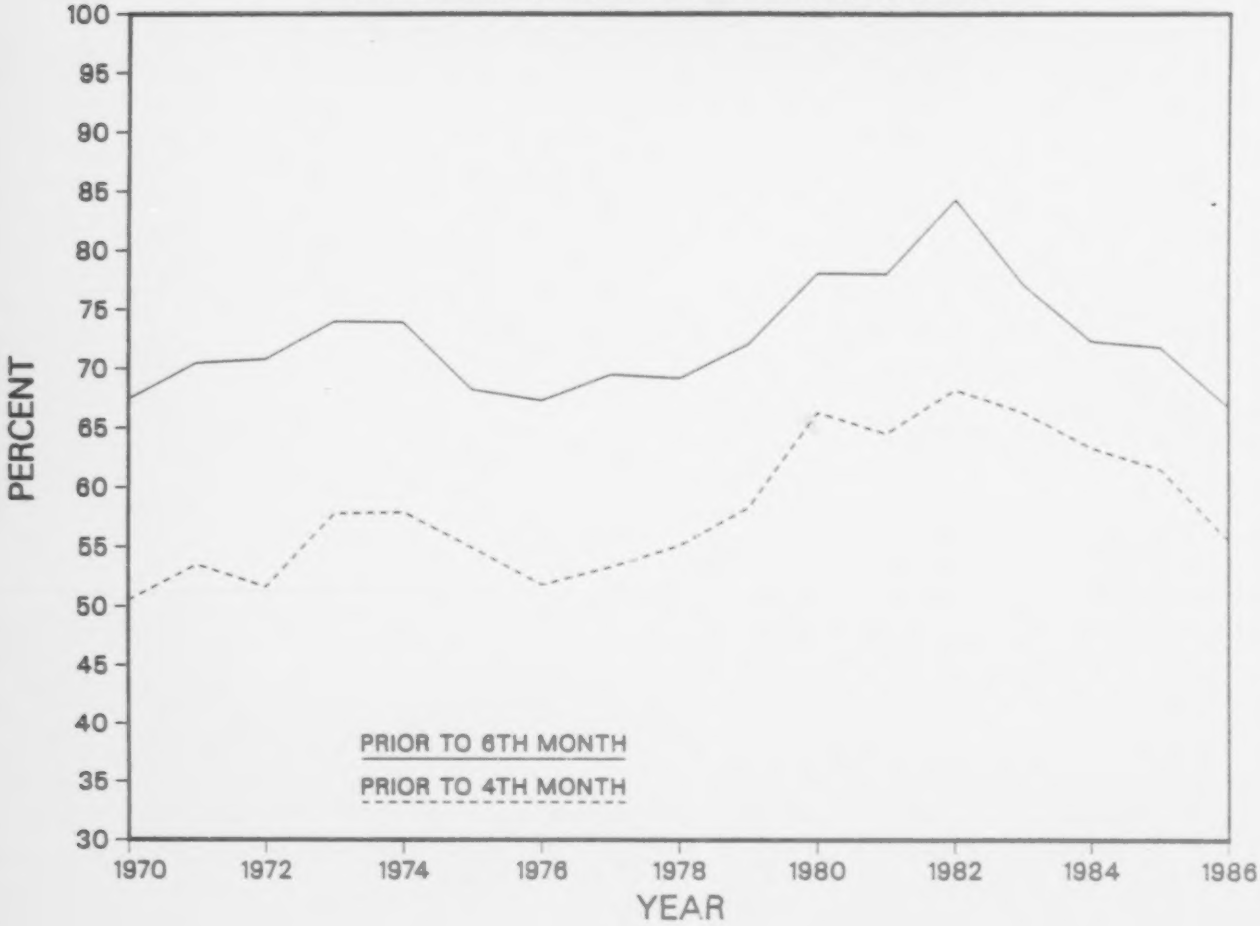

TABLE 1.41

Fetal Deaths by Gestational Age and
Number of Prenatal Visits,
Michigan Residents, 1986

GESTATIONAL AGE IN COMPLETED WEEKS	NUMBER	PERCENT	MEDIAN NUMBER OF VISITS
Under 20	10	1.2	4
20-23	130	15.0	4
24-27	99	11.4	5
28-31	86	9.9	6
32-35	103	11.9	7
36-39	142	16.4	9
40-43	74	8.6	12
44 or More	14	1.6	9
Unknown	207	23.9	3
Total	865	100.0	6

minimum number of prenatal visits required to meet the definition of adequate care when the gestational age at birth is less than 36 weeks, the percent of the fetal deaths which were born to women with adequate prenatal care should not be affected by the shorter gestational age experienced by many fetal deaths.

FETAL WEIGHT

Among live births, the percentage of infants weighing less than 2,500 grams at birth was 6.9. The comparable percent among fetal deaths was 74.6. The distribution of fetal weight by plurality for fetal deaths is presented in Table 1.45. Note that twin deliveries are not sets, but are total occurrences and that any given set may have included a live birth. The percent of single delivery fetal deaths under 2,500 grams was 73.5. The comparable percent for twin deliveries was 85.3.

The fetal weight distribution is strongly associated with gestational age (Table 1.46). The median fetal weight for all fetal deaths was 1,106 grams compared to a median birthweight of 3,402 grams for live births. For deaths of fetuses of 32-35 weeks of age, the median was 1,615 grams, while for the normal gestational age range of 36-39 weeks the median weight was only 2,608 grams.

Table 1.42
Fetal Deaths by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1986

MONTH CARE BEGAN	NUMBER OF VISITS							
	TOTAL	NONE	1-4	5-9	10-14	15-19	20 OR OVER	UNKNOWN
TOTAL	865	41	146	260	153	21	9	235
First	76	-	7	34	15	6	4	10
Second	264	-	47	109	87	12	3	6
Third	140	-	34	68	30	1	2	5
Fourth	66	-	25	21	15	2	-	3
Fifth	31	-	18	8	4	-	-	1
Sixth	13	-	4	7	1	-	-	1
Seventh	10	-	4	6	-	-	-	-
Eighth	4	-	-	4	-	-	-	-
Ninth	3	-	2	-	1	-	-	-
No Care	41	41	-	-	-	-	-	-
Unknown	217	-	5	3	-	-	-	209

Table 1.43
Fetal Deaths, Total Births and Fetal Death Rates by Level of Prenatal Care and Race[1]
Michigan Residents, 1986

LEVEL OF CARE (KESSNER INDEX[2])	ALL BIRTHS			WHITE BIRTHS			BLACK BIRTHS			ALL OTHER BIRTHS		
	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES
Total	865	138,491	6.2	545	111,660	4.9	272	24,350	11.2	9	2,391	3.8
Adequate	360	100,506	3.6	295	83,815	3.5	58	15,083	3.8	6	1,585	3.8
Intermediate	315	26,954	11.7	156	19,970	7.8	123	6,382	19.3	-	562	-
Inadequate	133	8,271	16.1	62	5,703	10.9	68	2,373	28.7	2	184	*
Unknown	57	2,760	20.7	32	2,172	14.7	23	512	44.9	1	60	*

[1] Race not stated included in total columns only.

[2] The Kessner Index is a classification of prenatal care based on the month of pregnancy prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

Table 1.44
Number and Percent of Fetal Deaths by Level of the Mother's Prenatal Care and Race of Fetus, Michigan Residents, 1986

LEVEL OF PRENATAL CARE (KESSNER INDEX[1])	RACE OF FETUS									
	TOTAL		WHITE		BLACK		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Adequate	360	41.6	295	54.1	58	21.3	6	66.7	1	2.6
Intermediate	315	36.4	156	28.6	123	45.2	-	-	36	92.3
Inadequate	133	15.4	62	11.4	68	25.0	2	22.2	1	2.6
Unknown	57	6.6	32	5.9	23	8.5	1	11.1	1	2.6
Total	865	100.0	545	100.0	272	100.0	9	100.0	39	100.0

[1] The Kessner Index is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

Table 1.45
Fetal Deaths by Fetal Weight and Plurality[1]
Michigan Residents, 1986

WEIGHT	FETAL DEATHS	CUM. PERCENT	SINGLE DELIVERY	TWIN DELIVERY	TRIPLET DELIVERY	QUADRUPLET DELIVERY
500 Grams or Less .	225	26.0	195	30	-	-
501-1,000 Grams . .	179	46.7	166	13	-	-
1,001-1,500 Grams .	91	57.2	85	6	-	-
1,501-2,000 Grams .	74	65.8	66	8	-	-
2,001-2,499 Grams .	76	74.6	69	7	-	-
2,500-3,000 Grams .	86	84.5	76	10	-	-
3,001-3,500 Grams .	57	91.1	56	1	-	-
3,501-4,000 Grams .	36	95.3	36	-	-	-
4,001-4,500 Grams .	19	97.5	19	-	-	-
4,501 Grams or More	7	98.3	7	-	-	-
Not Stated	15	100.0	15	-	-	-
Total	865	100.0	790	75	-	-

[1] Plurality unknown included in fetal deaths column only

Table 1.46
Fetal Deaths by Fetal Weight and Gestational Age, Michigan Residents, 1986

FETAL WEIGHT IN GRAMS	GESTATIONAL AGE IN COMPLETED WEEKS								
	TOTAL	UNDER 20	20-23	24-27	28-31	32-35	36-39	40-43	44 OR MORE	UNKNOWN
Less Than 1501	495	9	126	89	65	47	14	2	-	143
1501-2499	150	1	-	4	13	41	49	11	2	29
2500 or Over	205	-	-	4	5	14	77	61	12	32
Unknown	15	-	4	2	3	1	2	-	-	3
Total	865	10	130	99	86	103	142	74	14	207
Median[1]	1106	490	435	595	1066	1615	2608	3232	2835	652

[1] Excluding unknown fetal weight.

MORTALITY

SECTION II

MORTALITY: AN OVERVIEW, 1986

RESIDENT DEATHS	80,177
CRUDE DEATH RATE	8.8
INFANT DEATHS	1,565
INFANT DEATH RATE	11.4
NEONATAL DEATHS	1,079
NEONATAL DEATH RATE	7.8
PERINATAL DEATHS	1,782
PERINATAL DEATH RATE	12.9
MATERNAL DEATHS	11
MATERNAL DEATH RATE	0.8
DEATHS FROM HEART DISEASE PER DAY	86
DEATHS FROM CANCER PER DAY	47
DEATHS FROM STROKE PER DAY	15
DEATHS FROM ACCIDENTS PER DAY	9
MEDIAN AGE AT DEATH	73 YEARS
MEDIAN AGE AT DEATH FOR MALES	70 YEARS
MEDIAN AGE AT DEATH FOR FEMALES	77 YEARS

MORTALITY

In 1986 there were 80,177 deaths recorded for Michigan residents, 1,542 more than in the previous year. The crude death rate per 1,000 population was 8.8 in 1986, compared to a rate of 8.7 observed in 1985 (Table 2.1). The age-adjusted death rate decreased in 1986 being 0.5 percent less than the age-adjusted rate for 1985. This latter rate, the age-adjusted rate, serves as a better measure of mortality than a crude death rate as age-adjusted death rates control for most of the differences or variations in the age composition of the populations.

Between 1900 and 1986 the number of deaths occurring to Michigan residents increased from 32,453 to 80,177. The 31,472 deaths recorded in 1902 was the lowest number of resident deaths in this century, while the number of resident deaths recorded in 1986

Table 2.1
Number of Deaths and Crude Death Rates,
Michigan and United States Residents, 1970 - 1986

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
1,921,031	9.5	1970	76,321	8.6
1,927,542	9.3	1971	77,395	8.6
1,963,944	9.4	1972	79,210	8.8
1,973,003	9.3	1973	78,522	8.7
1,934,388	9.1	1974	76,143	8.4
1,892,879	8.8	1975	74,522	8.2
1,909,440	8.8	1976	75,801	8.3
1,899,597	8.6	1977	74,144	8.1
1,927.788	8.7	1978	74,773	8.1
1,913,841	8.5	1979	73,480	7.9
1,989,841	8.8	1980	74,991	8.1
1,977,981	8.6	1981	75,818	8.2
1,974,797	8.5	1982	75,536	8.2
2,019,201	8.6	1983	76,639	8.4
2,039,369	8.6	1984	76,401	8.4
2,086,440	8.7	1985	78,635	8.7
2,099,000pr	8.7pr	1986	80,177	8.8

was the greatest number of resident deaths for the century.

Although the total number of deaths increased between 1900 and 1986, the increase is due to an increasing population. The crude death rate decreased from 13.4 (per 1,000 population) in 1900 to 8.8 in 1986. The 1979 death rate of 7.9 was the lowest crude death rate ever recorded for Michigan. The highest death rate (15.6) was observed in 1918 (Figure 2.1).

A comparison of deaths and crude death rates for Michigan and the United States for the period 1970-1986 is presented in Table 2.1. Between 1970 and 1985, the Michigan rates had consistently been below or equal to the United States rates. In 1986, the Michigan rate of 8.8 was above the United States provisional rate of 8.7. The Michigan rates were relatively stable between 1970 and 1973, declined 9.2 percent between 1973 and 1979 and then increased to equal the 1972 rate. The national rates followed a similar pattern.

Between 1970 and 1986 the number of Michigan resident deaths increased by 5.1 percent and the crude death rate increased by 2.3 percent. The age-adjusted death rates displayed the opposite pattern by dropping 21.0 percent (Table 2.6). Over the period 1970-1986 the age-adjusted death rates for the nation declined by a greater amount, 24.4 percent. Over the period 1970 through 1986 the age-adjusted rates for Michigan were higher than national rates sixteen out of seventeen years. Between 1970 and 1983 the rates were similar, based upon the revised data in Table 2.6. By 1986 the age-adjusted rate for Michigan was 4.9 percent above the national rate.

The numbers of deaths by marital status and age for men and women are displayed in Table 2.2. The majority of men were married at the time of death while the majority of women were widows. Men were more than twice as likely as women to be married at the time of death (58.4 percent compared to 27.0 percent). Conversely, women were over three times as likely to be widows at the time of death as men were to be widowers (56.5 percent compared to 17.9 percent). Among males, 14.6 percent had never been married, while the corresponding figure for females was 9.3 percent. Men were also more likely to be divorced (8.8 percent compared to 7.1 percent).

Table 2.3 presents data on the number of deaths by race for the period 1970-1986. The number of deaths of white persons increased by 2.0 percent over these years while deaths of black persons increased by 29.2 percent. Reported deaths of American Indians remained fairly constant. In 1986 deaths of white persons numbered 68,602 and accounted for 85.6 percent of all deaths, while deaths of black persons constituted 14.1 percent of the state total.

It should be noted that data on race are derived from the death certificates filed by funeral directors. Data from sources where race is self-enumerated, when matched with death data, indicate larger numbers of American Indians and persons of other races than reported as members of those groups on the death certificate.[1]

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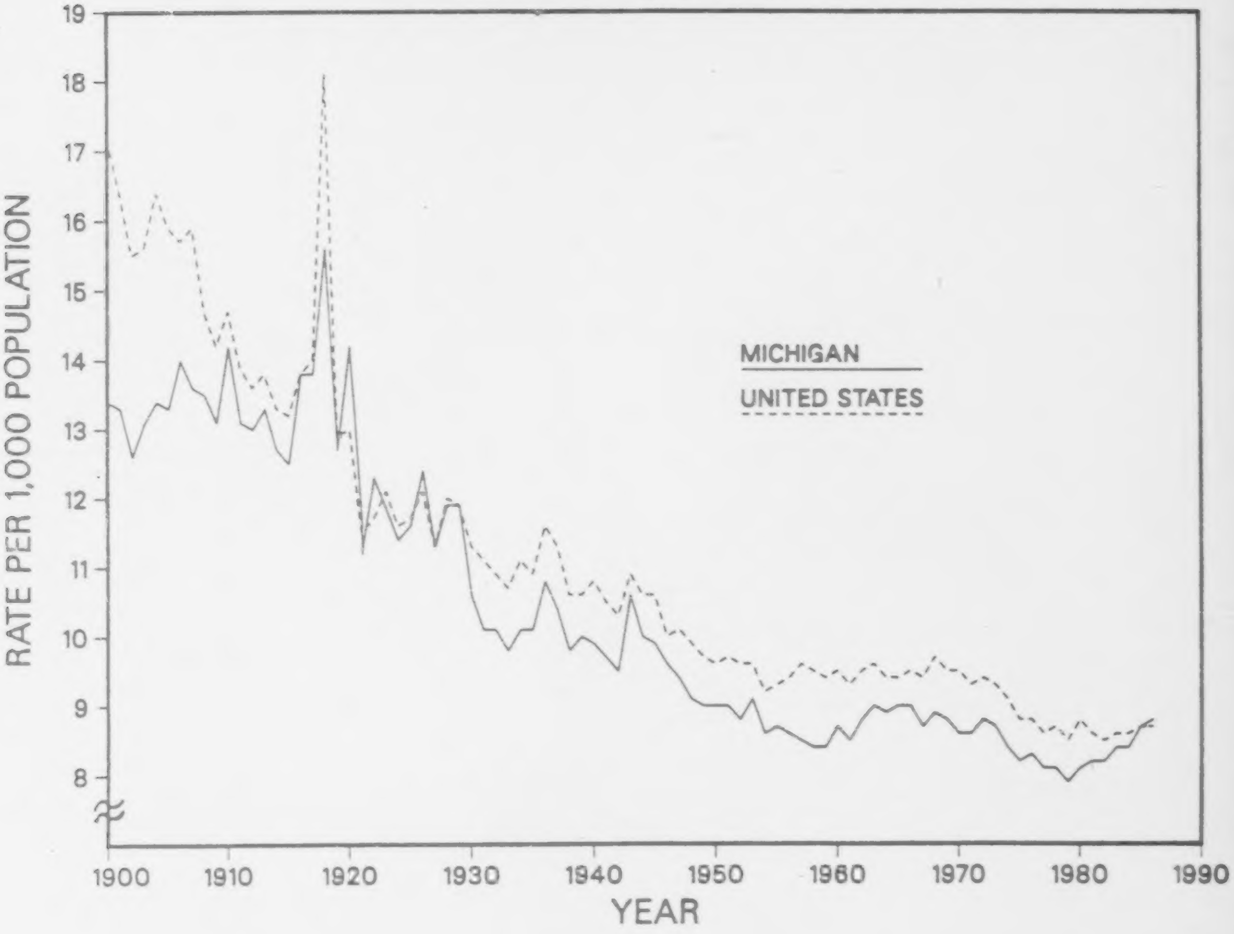
[1] National Center for Health Statistics, Comparability of Marital Status, Race, Nationality and Country of Origin in the Death Certificate and Matching Census Record: United States, May - August, 1986 (Washington, D.C., 1969).

FIGURE 2.1
CRUDE DEATH RATES, MICHIGAN AND UNITED STATES[1]
RESIDENTS, 1900-1986



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[1] United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

Table 2.2
Deaths by Age, Sex, and Marital Status, Michigan Residents, 1986

AGE IN YEARS	MALES						FEMALES					
	TOTAL	NEVER MARRIED	DIVORCED	WIDOWER	MARRIED[1]	UNKNOWN	TOTAL	NEVER MARRIED	DIVORCED	WIDOW	MARRIED[1]	UNKNOWN
Under 15	1,291	1,291	-	-	-	-	910	910	-	-	-	-
15-24	1,209	1,119	10	-	80	-	408	353	7	2	46	-
25-34	1,519	791	203	6	516	3	591	223	102	14	251	1
35-44	1,753	381	450	21	895	6	964	159	242	48	511	4
45-54	2,665	277	563	61	1,755	9	1,691	124	322	197	1,046	2
55-64	6,835	578	959	451	4,830	17	4,297	217	550	1,050	2,471	9
65-74	10,803	735	880	1,473	7,678	37	7,785	384	618	3,657	3,118	8
75-84	10,482	639	488	2,781	6,541	33	10,773	539	505	7,448	2,273	8
85+	5,485	327	160	2,732	2,257	9	10,702	642	342	9,114	594	10
Unknown	9	1	-	-	-	8	1	-	-	-	1	-
All Ages	42,051	6,139	3,713	7,525	24,552	122	38,122	3,551	2,688	21,530	10,311	42

[1] Includes legally separated.

Table 2.3
Number of Deaths by Race[1], Michigan Residents, 1970 - 1986

YEAR	ALL RACES	WHITE	BLACK	AMERICAN INDIAN	OTHER[2]
1970	76,321	67,270	8,731	127	54
1971	77,395	67,847	9,259	128	45
1972	79,210	69,598	9,409	126	40
1973	78,522	68,502	9,641	121	54
1974	76,143	66,600	9,233	128	58
1975	74,522	65,191	9,024	118	60
1976	75,801	66,334	9,146	125	70
1977	74,144	64,816	9,038	140	53
1978	74,773	65,149	9,254	152	72
1979	73,480	63,955	9,188	129	75
1980	74,991	64,897	9,704	137	93
1981	75,818	65,559	9,950	127	78
1982	75,536	65,259	9,941	148	101
1983	76,639	66,103	10,178	163	121
1984	76,401	65,732	10,359	129	115
1985	78,635	67,426	10,903	130	116
1986	80,177	68,602	11,283	139	134

[1] Deaths with race not stated included in total column only. Persons of Spanish or of Mexican-American descent are included with white.

[2] Includes Chinese, Japanese, Filipino, Hawaiian, other Asian or Pacific Islander. Indians from India were counted as "White" from 1970 - 1977 and with "Other" since 1978.

Michigan resident deaths in 1986 are tabulated by age, race, and sex in Table 2.4. Of the 80,177 Michigan resident deaths that occurred in 1986, 42,051 (52.4 percent) occurred to males and 38,122 occurred to females (4 records had sex not stated). The median age at death for males was 70 years, compared to a significantly higher figure of 77 years for females. The median age at death was 74 years for white persons, 65 years for black persons and 64 years for persons of other races.

In 1986, 24,137 or 30.1 percent of all deaths occurred to persons under the age of 65. The proportion dying under age 65 was greater for males than females and greater for persons of other races than for white persons or black persons. For deaths of white persons 32.8 percent of the males and 20.4 percent of the females died before age 65. For deaths of black persons 55.4 percent of the males and 41.8 percent of the females died before age 65. For persons of races other than black or white, the percentage of the males (55.1) who died before the age of 65 was lower than the percentage for black males and higher than the percentage for white males. The percentage of females of races other than black or white (46.2) was greater than the percentages of both black and white females.

Since about eighty-nine percent of the population is below age 65, a better reflection of the probability of living to age 65 is obtained from appendix Tables 4.19 - 4.27. Based on current age-specific death rates, 75.3 percent of white males born in 1986 would survive to age 65. The percentages are 85.3, 54.3 and 72.7 respectively for white females, black males and black females.

Unadjusted, age-specific, and age-adjusted death rates by race and sex are presented in Table 2.5. The unadjusted rate for males of 944.8 was 16.3 percent above that for females while the age-adjusted rate for males was 70.5 percent higher than the age-adjusted rate for females. The population with the lowest unadjusted death rate was black females (754.4) and the highest unadjusted rate was experienced by black males (1,105.3).

Age-adjusting the data produced a different relationship, with the age-adjusted rate being lowest for white females rather than for black females. The age-adjusted rate was still highest for black males.

The age-specific death rates for all males and all females displayed in Figure 2.2 indicate a similar pattern. Rates for both sexes declined from birth to a low for ages 1-14 years. The rate for males aged 15-24 was 4.2 times higher than the rate for males 1-14 years of age, while the rate for females in the 15-24 years age group was 1.9 times higher than the rate for their 1-14 years of age counterparts. Rates for both sexes rose through the terminal age group (85 years and over). Rates for males were consistently above those for females with the greatest relative differential occurring in the age group 15-24 years, where the rate for males was 2.9 times that for females.

A comparison by race of 1986 age-specific death rates for males is graphically presented in Figure 2.3. Rates for white and black males were 4.1 and 5.0 times higher for the 15-24 age groups than for the 1-14 age groups. Between ages 15-24 and 25-34 the rate for white males increased by 13.5 percent, while the corresponding increase for black males was 72.8. Rates for black males were above those for white males at all ages below 85 years. The largest relative differential was for persons from 35 through 44 years of age, where the rate for black males was 4.0 times that of white males. Beyond age 84, the rates for white males were higher.

The overall death rate of 1,105.3 per 100,000 for black males was 18.8 percent higher than the rate for white males (930.6). This is a reflection of the younger age distribution of the black male population and the higher death rates for black males under age 85 years, especially in the 15-54 year age groups where rates were 2.2 to 4.0 times higher than rates for their white male counterparts. The age-adjusted death rate for black males, which is a better indicator of relative mortality, was 65.8 percent higher than that for white males.

Rates for black females were higher than those for white females at all ages prior to 85 years (Figure 2.4). For women from 25 through 44 years, the rates for black females were 2.8 to

Table 2.4
Number of Deaths by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	1,565	924	637	999	599	397	553	317	235	12	7	5
1-4	277	154	123	206	113	93	70	40	30	1	1	-
5-9	157	87	70	106	61	45	49	25	24	2	1	1
10-14	206	126	80	153	93	60	51	32	19	2	1	1
15-19	716	531	185	531	386	145	182	143	39	3	2	1
20-24	901	678	223	651	478	173	246	197	49	3	3	-
25-29	958	720	238	660	500	160	293	218	75	5	2	3
30-34	1,152	799	353	728	517	211	410	274	136	14	8	6
35-39	1,304	879	425	824	545	279	469	328	141	11	6	5
40-44	1,413	874	539	1,005	614	391	397	253	144	11	7	4
45-49	1,725	1,057	668	1,304	798	506	398	246	152	20	11	9
50-54	2,631	1,608	1,023	2,018	1,244	774	597	350	247	16	14	2
55-59	4,458	2,798	1,660	3,628	2,301	1,327	815	491	324	14	6	8
60-64	6,674	4,037	2,637	5,593	3,399	2,194	1,052	618	434	26	17	9
65-69	8,477	4,937	3,540	7,221	4,238	2,983	1,233	688	545	22	11	11
70-74	10,111	5,866	4,245	8,890	5,166	3,724	1,191	684	507	27	15	12
75-79	10,696	5,569	5,127	9,497	4,960	4,537	1,169	597	572	29	11	18
80-84	10,559	4,913	5,646	9,597	4,440	5,157	940	455	485	21	17	4
85-89	8,561	3,269	5,292	7,885	2,993	4,892	657	263	394	18	13	5
90+	7,626	2,216	5,410	7,098	2,053	5,045	511	159	352	16	3	13
Not Stated	10	9	1	8	7	1	-	-	-	-	-	-
All Ages	80,177	42,051	38,122	68,602	35,505	33,094	11,283	6,378	4,904	273	156	117
Median Age At Last Birthday	73	70	77	74	71	78	65	62	68	64	62	66

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[1] Deaths with race not stated are included only in the total column.

Table 2.5
Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	876.8	944.8	812.2	879.7	930.6	830.9	919.5	1105.3	754.4
Under 1 Year	1130.9	1306.8	946.3	881.3	1034.5	720.0	2522.2	2861.0	2176.1
1-14 Years	33.2	37.2	29.1	29.6	33.1	25.9	53.0	59.9	45.9
15-24 Years	106.2	157.8	54.0	93.3	134.6	50.9	182.6	297.1	73.4
25-34 Years	135.0	196.8	74.7	104.5	152.8	55.9	332.2	513.5	182.2
35-44 Years	219.9	289.6	153.0	171.4	218.9	124.6	582.9	873.9	347.2
45-54 Years	488.0	614.7	368.3	424.9	532.5	321.3	990.6	1327.9	718.1
55-64 Years	1340.6	1727.5	988.5	1256.3	1622.0	920.3	2063.2	2672.3	1546.9
65-74 Years	3002.7	3966.6	2245.5	2911.8	3858.6	2166.6	3896.1	5059.9	2997.1
75-84 Years	6749.6	8835.7	5488.7	6696.9	8804.2	5435.3	7494.5	9421.1	6226.1
85 Years and Over	15605.2	18007.2	14605.2	15815.6	18315.9	14788.9	13629.5	14968.2	12971.7
Age-Adjusted Rate[2]	566.9	734.8	431.0	529.2	685.4	404.0	857.1	1136.4	632.4

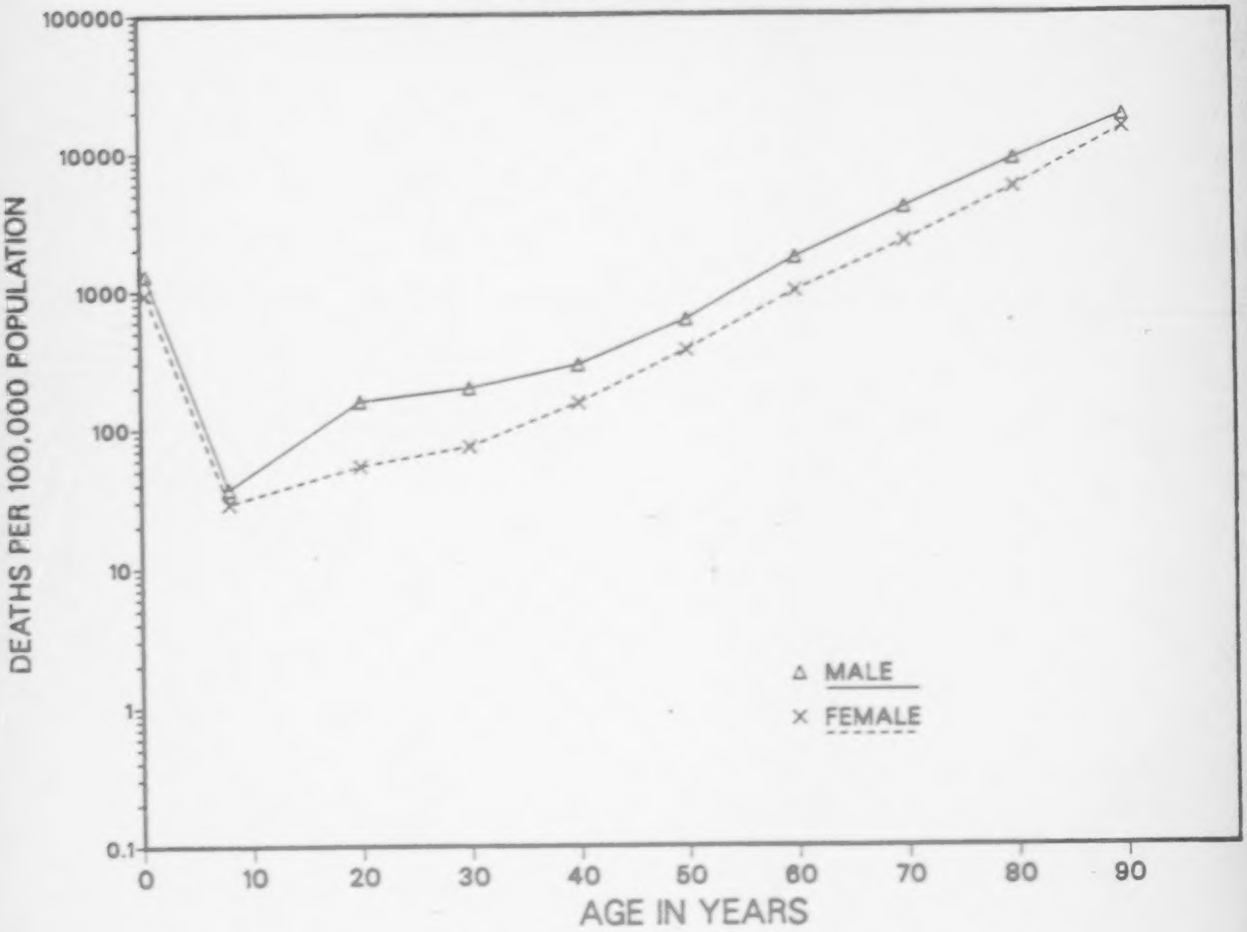
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.2
AGE-SPECIFIC DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

3.3 times the rate for white females. The death rate for all ages was 830.9 for white females and 754.4 for black females reflecting the greater concentration of the white female population in the older age intervals with relatively high death rates. After adjusting for differences in the age distributions of the populations, the rate for black females was 56.5 percent greater than that for their white counterparts.

In Table 2.6, population and death counts for black and additional other than white persons have been combined for the purpose of calculating "other than white" age-adjusted mortality rates. This grouping was made because the National Center for Health Statistics provides national age-adjusted data only for white and other than white categories.

Michigan age-adjusted death rates for other than white persons were considerably higher than comparable rates for white persons throughout the period 1970-1986 (Table 2.6). Age-adjusted rates for other than white males ranged between 34.0 percent (in 1978) and 57.1 percent (in 1986) higher than comparable rates for white males in Michigan. For females this differential was less extreme with the rate for other than white women exceeding that for white women by 34.5 percent (in 1975) to 49.5 percent (in 1986).

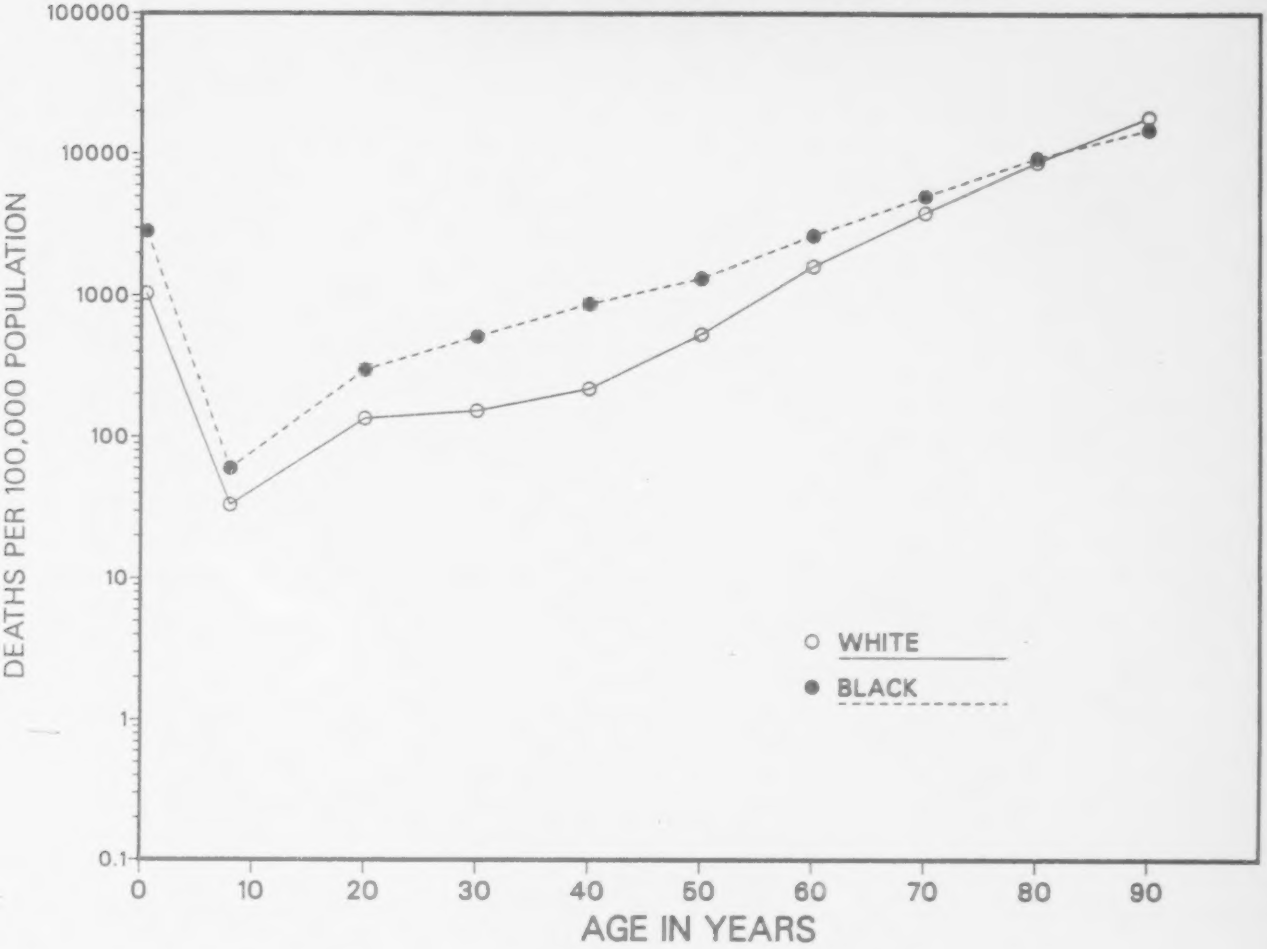
Declines have occurred since 1970 both in Michigan and the United States in age-adjusted death rates in each race-sex group. Michigan's age-adjusted rate for the population as a whole declined by 21.0 percent between 1970 and 1986 while the estimated decline for the United States was 24.4 percent.

For the other than white population, the relative decline in Michigan was less than it was for the United States through the year 1985, the last year for which national data were available. For Michigan other than white persons, male age-adjusted rates declined 11.5 percent and female rates declined 21.1 percent between 1970 and 1985. The United States rates for these groups declined by 26.1 and 31.2 percent, respectively, during this period. The Michigan rates for white males and females declined 21.2 and 21.1 percent, respectively. The United States rates for these groups dropped 22.9 and 22.1 percent, respectively, during the same period.

During the period 1970 through 1985, the age-adjusted mortality rates for Michigan white females have been consistently greater than the rates for their national counterparts. For nine of the sixteen years of this period, Michigan white male rates have exceeded the national white male rates. Michigan rates for other than white females were less than the rates for their national counterparts from 1970 through 1977 and greater since then. For Michigan other than white males the age-adjusted mortality rates have been greater than the rates for national other than white males for fourteen of the sixteen years of the period.

Between 1970 and 1986, the minimum age-adjusted death rates were achieved in 1986 for Michigan white males and in 1985, the latest available year, for the United States white males and females. However, for the United States, other than white males and females had their lowest rates in 1984, while in Michigan white females and other than white males and females achieved their lowest rates in 1982. Rates have risen 2.1, 12.0 and 10.6 percent for Michigan white females and other than white males and females, respectively, between 1982 and 1986.

FIGURE 2.3
AGE-SPECIFIC DEATH RATES BY RACE,[1]
MICHIGAN RESIDENT MALES, 1986



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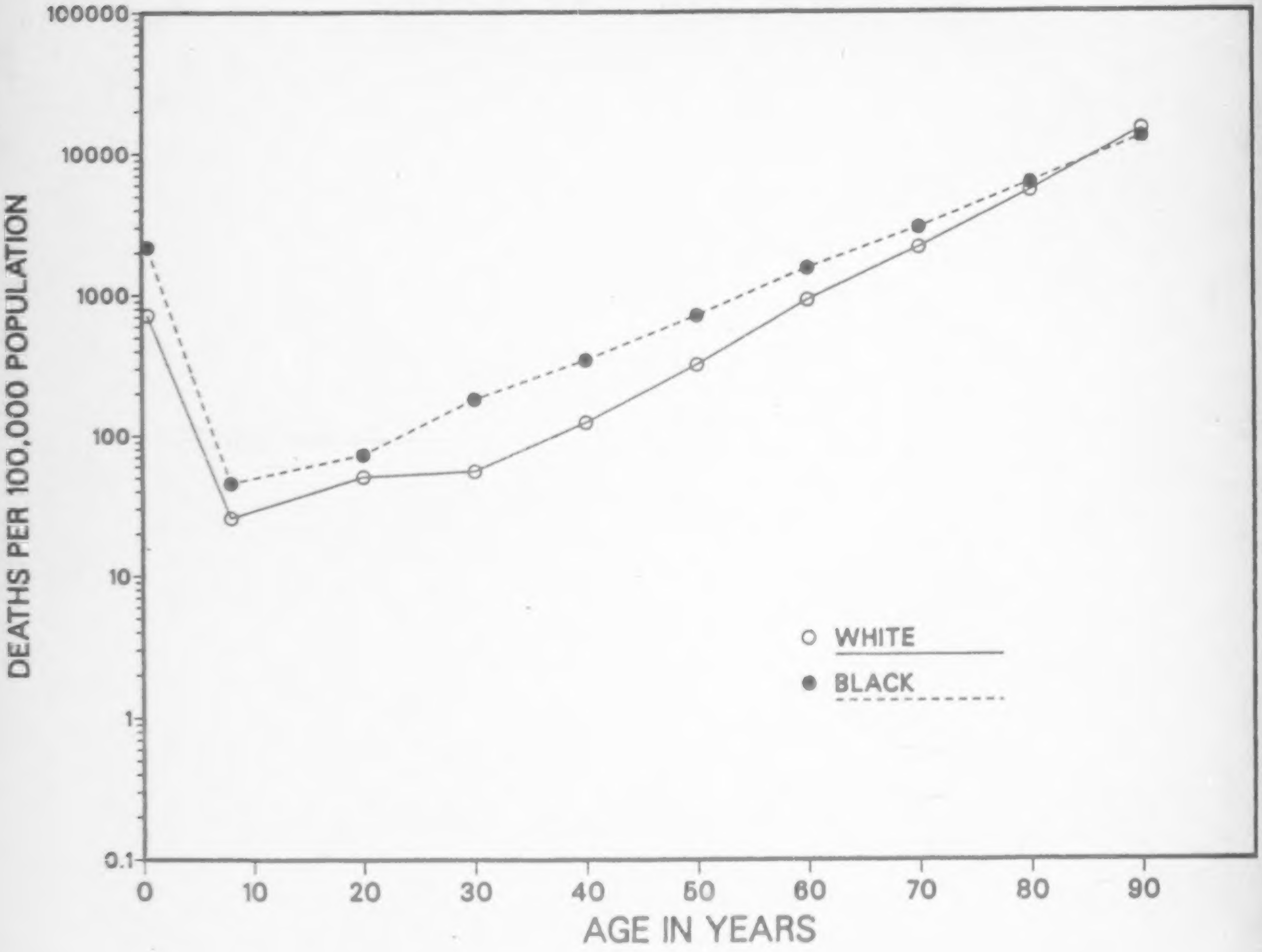
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.4

AGE-SPECIFIC DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1986



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[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

Table 2.6
Age-Adjusted Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	717.5	925.9	537.3	685.5	889.4	510.8	961.5	1201.7	744.8
	1971	707.9	922.9	524.0	672.5	881.2	495.7	969.6	1226.9	739.3
	1972	711.1	928.2	526.4	677.2	888.0	499.4	954.7	1220.4	719.6
	1973	694.3	906.3	513.7	658.4	862.6	486.0	949.5	1223.6	709.2
	1974	660.7	865.1	488.0	628.4	824.6	464.2	885.2	1153.2	651.4
	1975	640.2	840.3	472.4	610.1	800.5	452.0	846.1	1122.0	607.8
	1976	636.1	838.5	469.1	607.2	801.4	448.5	835.0	1100.7	608.1
	1977	614.4	814.8	449.4	587.3	781.6	428.8	802.2	1049.4	592.9
	1978	606.3	797.8	449.8	578.7	765.7	426.8	798.9	1025.7	608.9
	1979	585.4	775.6	431.4	557.9	742.5	409.7	773.0	1007.6	577.6
	1980	588.0	773.9	438.7	557.1	735.5	414.9	797.3	1045.8	594.3
	1981	567.4	752.1	424.5	542.2	718.5	403.0	742.4	977.6	554.1
	1982	556.9	739.5	416.8	531.9	705.4	395.6	730.9	961.8	546.1
	1983	557.1	735.0	421.2	531.1	698.7	399.3	738.9	973.3	551.7
	1984	564.5	736.5	431.3	533.7	694.8	407.2	779.4	1024.5	582.0
	1985	570.0	747.3	427.6	534.9	701.2	402.8	801.0	1063.7	587.9
	1986	566.9	734.8	431.0	529.2	685.4	404.0	815.2	1076.8	603.9
U.S.	1970	714.3	931.6	532.5	679.5	893.4	501.7	983.4	1231.4	770.8
	1971	697.6	913.3	519.1	663.7	876.0	489.1	959.5	1206.7	749.8
	1972	698.0	918.0	516.6	664.0	879.3	487.6	958.6	1223.1	737.1
	1973	687.3	905.9	508.1	654.0	868.5	479.3	942.2	1199.5	728.1
	1974	659.5	870.9	487.0	629.0	836.1	461.0	889.6	1142.4	680.5
	1975	630.4	837.2	462.5	602.2	804.3	439.0	840.6	1090.1	634.5
	1976	618.5	820.9	455.0	591.3	789.3	432.5	818.5	1063.4	618.3
	1977	602.1	801.3	441.8	575.7	770.6	419.6	796.7	1036.1	601.8
	1978	595.0	791.4	437.4	569.5	761.1	416.4	780.0	1021.0	585.8
	1979	577.0	768.6	423.1	551.9	738.4	402.5	757.1	994.8	566.9
	1980	585.8	777.2	432.6	559.4	745.3	411.1	774.2	1015.1	582.6
	1981	568.2	753.3	420.4	544.6	724.4	401.4	732.6	964.3	549.4
	1982	553.8	733.1	411.2	531.8	706.0	393.3	704.6	928.4	529.3
	1983	550.5	725.3	411.5	528.0	698.4	392.7	703.1	916.3	535.2
	1984	545.9	716.7	409.6	523.6	689.9	391.3	694.5	904.4	529.0
	1985	546.1	716.8	409.4	523.1	688.7	390.6	697.8	910.4	530.0
	1986[3]	540.2	---	---	---	---	---	---	---	---

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[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes).

[3] Provisional Data.

LEADING CAUSES OF DEATH

Deaths due to the 10 leading causes accounted for 84.2 percent of all deaths in 1986. Diseases of the heart were the leading cause of death with 39.0 percent of all deaths due to heart diseases. Another 21.6 percent of the deaths were due to cancer. Together these two causes of death were responsible for 60.6 percent of all Michigan resident deaths.

Causes of death since 1979 are classified according to the Ninth Revision International Classification of Diseases (ICD-9) published by the World Health Organization. The causes-of-death from 1900 through 1978 were coded based on earlier revisions of the International Classification of Disease.

During the twentieth century there have been nine revisions published in 1900, 1909, 1920, 1929, 1939, 1948, 1955, 1968 and 1979. The first revision was used in Michigan in 1900 to code cause of death starting with 1898 deaths. Between 1929 and 1939 data were coded using the fourth revision. It is unclear if and/or when the second and third revisions were used in Michigan. The fifth through eight revisions were used from 1940 through 1949, 1950 through 1957, 1958 through 1967, and 1968 through 1978, respectively.

The cause-of-death ranking procedure used in Michigan is identical to that used by the National Center for Health Statistics (NCHS). It is based on a *"List of 72 Selected Causes of Death,"* which NCHS constructed by combining titles in the *"List of 282 Selected Causes of Death."* This latter list, which is also used in this publication, was constructed by aggregating the detailed titles of ICD-9.

The numbers of deaths and the death rates for the 10 leading causes for 1986 are shown in Table 2.7, and the percentage of total deaths resulting from each of these causes is illustrated in Figure 2.5. The ranking of the 10 leading causes for 1986 was different than the rankings for 1984 and 1985. In 1981 through 1983 chronic liver disease and cirrhosis was ranked 9th and atherosclerosis was ranked 8th. In 1984 the order of these two causes reversed. In 1986 atherosclerosis was again ranked 8th and chronic liver disease and cirrhosis was ranked 9th.

Crude death rates in Michigan were higher in 1986 than in 1985 for six of the ten leading causes. The rates were higher in 1986 for deaths due to diseases of the heart, chronic obstructive pulmonary diseases and allied conditions, pneumonia and influenza, diabetes mellitus, atherosclerosis and suicide. The rates were lower for malignant neoplasms, cerebrovascular diseases, accidents and adverse effects and chronic liver disease and cirrhosis.

The order of the 10 leading causes for the United States in 1986 was similar to that for Michigan. The only difference was in the order of the causes ranked 8th and 10th. The overall Michigan death rate was slightly higher than the national rate. Nonetheless, Michigan's rates for malignant neoplasms, cerebrovascular disease, accidents and adverse effects, pneumonia and influenza and suicide were lower than comparable national rates (Table 2.7).

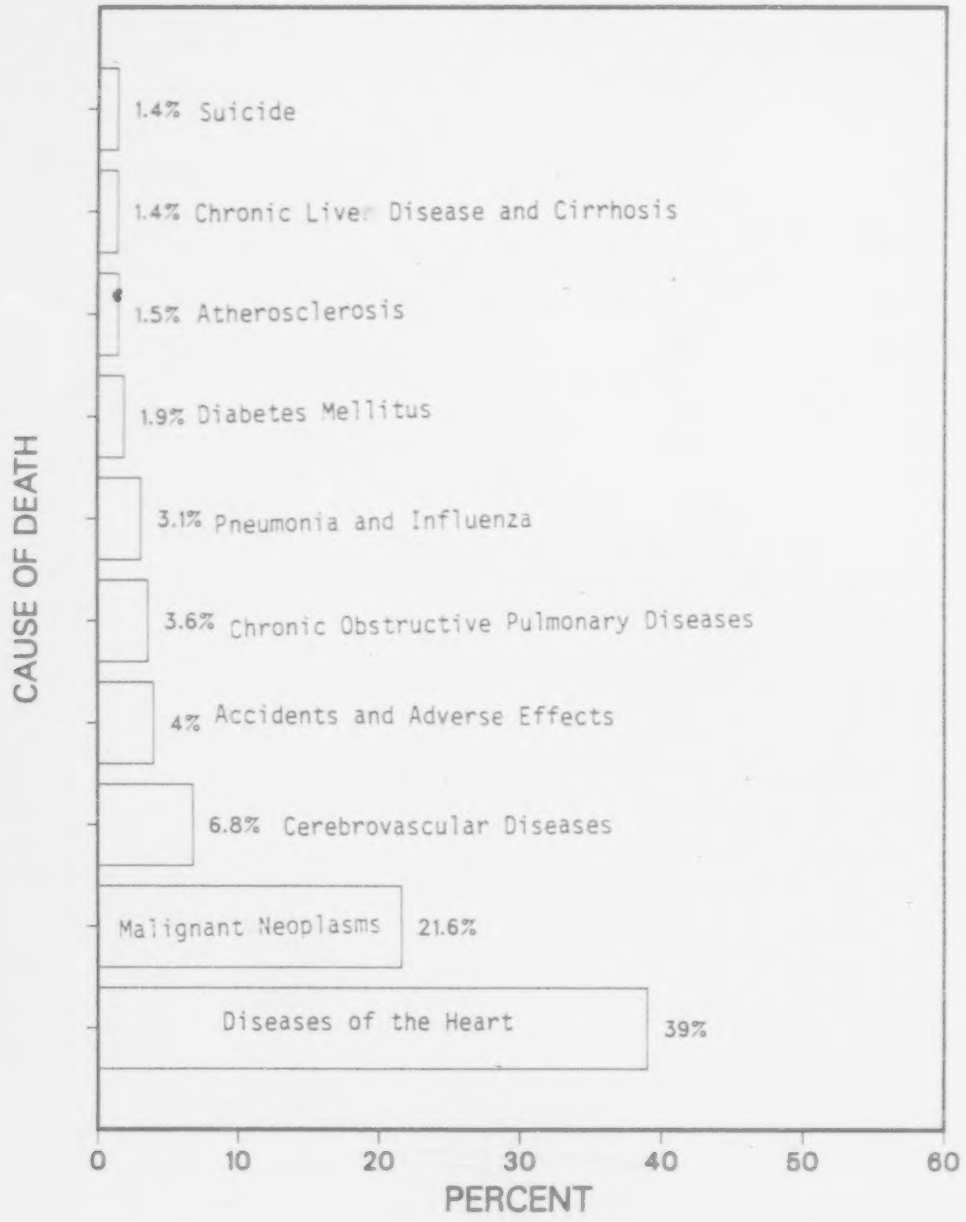
During the years 1968-1978 the Eighth Revision International Classification of Dis-

Table 2.7
Leading Causes of Death and Cause-Specific Rates, Michigan and United States Residents, 1986

RANK	CAUSE OF DEATH	NUMBER OF DEATHS		RATE	
		MICHIGAN	U.S.[1]	MICHIGAN	U.S.[1]
1	Diseases of the Heart	31,270	768,350	342.0	318.7
2	Malignant Neoplasms	17,321	465,980	189.4	193.3
3	Cerebrovascular Diseases	5,421	147,790	59.3	61.3
4	Accidents and Adverse Effects	3,202	95,640	35.0	39.7
5	Chronic Obstructive Pulmonary Diseases and Allied Conditions	2,870	75,420	31.4	31.3
6	Pneumonia and Influenza	2,513	70,500	27.5	29.2
7	Diabetes Mellitus	1,494	36,340	16.3	15.1
8	Atherosclerosis	1,214	22,120	13.3	9.2
9	Chronic Liver Disease and Cirrhosis	1,120	26,210	12.2	10.9
10	Suicide	1,119	31,470	12.2	13.1
	Sub Total	67,544	1,739,820	738.6	721.8
	All Other Causes	12,633	359,180	138.1	149.0
	Total	80,177	2,099,000	876.8	870.8

[1] United States data are estimates based on a 10 percent sample of deaths.

FIGURE 2.5
LEADING CAUSES OF DEATH, MICHIGAN RESIDENTS, 1986



eases, Adapted for Use in the United States (ICDA-8) was used to classify causes of death. The introduction of the Ninth Revision in 1979 resulted in a change in the ranking of the 10 leading causes between 1978 and 1979. The ranking of the four leading causes of death, heart disease, cancer, stroke, and accidents, was not changed. However, the fifth leading cause of death since 1979, chronic obstructive pulmonary diseases and allied conditions, was a new category, comparable to the Eighth Revision categories of bronchitis, emphysema, asthma, and chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema. This latter category was used increasingly by physicians during the 1970's in preference to more specific categories.

During the years in which the Eighth Revision was used, bronchitis, emphysema, and asthma were grouped together for purposes of ranking, and chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema was not used in ranking. The causes ranked 6th to 10th since 1979 are the same as the causes ranked 5th to 9th in 1978, although the order was slightly different in 1981 through 1983 and 1986. The 10th leading cause of death in 1978, homicide, is no longer ranked among the top 10. The number of homicides in 1986 was 1,115, four fewer than the number of suicide deaths.

Table 4.8 shows the numbers of deaths and death rates for each year during this century for several major causes including seven causes currently ranked among the 10 leading causes of death. There has been no change in the ranking of the four leading causes since 1950. From 1950 through 1978 the ranks of 5th and 6th were held by diabetes mellitus and pneumonia and influenza, with pneumonia and influenza ranking 5th in 19 of the 29 years. For the past eleven years pneumonia and influenza has ranked above diabetes.

Atherosclerosis, previously termed arteriosclerosis, has consistently been among the ten leading causes of death, ranking 7th in 1950 and 8th in 1986. The 9th leading cause of death in 1986, chronic liver disease and cirrhosis (formerly titled cirrhosis of the liver) was not among the ten leading causes of death in 1950. This cause ranked 10th in 1955 and has been among the ten most frequent causes consistently since 1960. It was the 7th leading cause each year from 1969 through 1978 and between 8th and 9th from 1979 through 1986. Suicide, the 10th leading cause in 1986, first ranked in the top ten in 1963 when it also was the 10th leading cause. In 1986, seven of the ten leading causes of death were chronic conditions, one was an acute disease category, and two were external non-disease groupings.

While the most frequent causes of death among all Michigan residents have changed little in recent years, this does not imply similarity in the leading causes of death among residents of different ages, sexes or races. Table 2.8 presents the five most frequent causes of death by age, sex and race. Races other than white and black are not presented in this table because of the small number of deaths in any age-sex-cause of death category.

There are differences in the leading causes of death associated with age, race and sex. Diseases of the heart are among the most frequent causes in all but two categories. Malignant neoplasms, accidents and homicides have the next most widespread significance, being present respectively in 26, 22 and 18 of the 32 age-sex-race groupings.

The variation in leading causes of death by age is most evident among deaths to infants under one year. This category has little similarity to any other age group. External causes of death, including accidents, suicide and homicide, are predominant killers among persons 1 through 34 years of age. Among persons 35 years and over, chronic conditions are responsible for the majority of deaths.

Homicide was one of the top five leading causes of death for all age groups under 65 years of age among black males and was the leading cause for black males 15 to 34 years of age. Similarly, for black females homicide was one of the top five leading causes for all age groups under 50 years of age and the leading cause for the groups 15 to 24 and 25 to 34 years of age.

Homicide was the third and fifth leading cause, respectively, for white males 15 to 24 and 25 to 34 years of age. Among white females homicide was the fourth and fifth leading cause of death for ages 5-24 and 25-34 years, respecively. It was not among the top five causes of death for white males and females in other age categories.

Among white males, accidents were one of the top five leading causes for all ages under 50 years and the leading cause for the ages 1 to 34 years. Suicides were the second leading cause of death for ages 15-34 and fourth for age groups 5-14 and 35-49 among white males. Accidents were one of the top leading causes of death among black males 1 through 49 years of age and the leading cause for ages 1 to 14 years. Suicide was the third leading cause among black males age 15 to 24 years.

Among white females accidents were the leading cause of death for ages 1-34 and the third leading cause for infants under one year of age and adults age 35 to 49 years. Suicide was the third or fourth leading cause for ages 15 to 49 years. For black females accidents were one of the top five causes for all age groups under 35 years of age and the leading cause for ages 1-14 years. Suicide was the third leading cause of death among black females 15-24 years of age.

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986

TOTAL POPULATION[1]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[2]
All Ages	1. Diseases of the Heart	31,270	342.0
	2. Malignant Neoplasms	17,321	189.4
	3. Cerebrovascular Diseases	5,421	59.3
	4. Accidents	3,202	35.0
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	2,870	31.4
	All Causes	80,177	876.8
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	840	607.0
	2. Congenital Anomalies	291	210.3
	3. Diseases of the Heart	29	21.0
	4. Accidents	24	17.3
	5. Homicide	14	10.1
	All Causes	1,565	1,130.9
1-4 Years	1. Accidents	96	17.5
	2. Congenital Anomalies	45	8.2
	3. Malignant Neoplasms	22	4.0
	4. Homicide	16	2.9
	5. Diseases of the Heart	14	2.5
	All Causes	277	50.4
5-14 Years	1. Accidents	178	12.9
	2. Malignant Neoplasms	55	4.0
	3. Congenital Anomalies	24	1.7
	4. Homicide	20	1.5
	5. Diseases of the Heart	7	0.5
	All Causes	363	26.4
15-24 Years	1. Accidents	704	46.3
	2. Homicide	344	22.6
	3. Suicide	194	12.7
	4. Malignant Neoplasms	96	6.3
	5. Diseases of the Heart	49	3.2
	All Causes	1,617	106.2
25-34 Years	1. Accidents	523	33.5
	2. Homicide	317	20.3
	3. Suicide	264	16.9
	4. Malignant Neoplasms	222	14.2
	5. Diseases of the Heart	143	9.1
	All Causes	2,110	135.0

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

TOTAL POPULATION[1]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[3]
35-49 Years	1. Malignant Neoplasms	1,093	64.3
	2. Diseases of the Heart	1,027	60.4
	3. Accidents	449	26.4
	4. Suicide	262	15.4
	5. Chronic Liver Disease and Cirrhosis	243	14.3
	All Causes	4,442	261.2
50-64 Years	1. Malignant Neoplasms	4,826	383.7
	2. Diseases of the Heart	4,791	380.9
	3. Cerebrovascular Diseases	588	46.8
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	455	36.2
	5. Chronic Liver Disease and Cirrhosis	411	32.7
	All Causes	13,763	1,094.3
65 and Over	1. Diseases of the Heart	25,208	2,429.1
	2. Malignant Neoplasms	11,005	1,060.5
	3. Cerebrovascular Diseases	4,614	444.6
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	2,337	225.2
	5. Pneumonia and Influenza	2,162	208.3
	All Causes	56,030	5,399.2

[1] Subtotals by sex and race do not add to the grand total as the race was not stated on records for 12 males and 7 females. In addition, the sex was not stated on 4 records for white and 1 other than white persons. Age groups do not add to respective totals because records with age not stated are included only in the total.

[2] Rates may not agree with those shown elsewhere in this section since records of unknown sex and race were randomly allocated prior to rate calculation for the other tables, and were not included in calculations for this table.

[3] Rate per 100,000 population

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

WHITE MALES'

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE'
All Ages	1. Diseases of the Heart	13,858	363.1
	2. Malignant Neoplasms	8,067	211.4
	3. Cerebrovascular Diseases	1,866	48.9
	4. Accidents	1,844	48.3
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	1,630	42.7
	All Causes	35,505	930.4
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	279	479.5
	2. Congenital Anomalies	142	244.0
	3. Diseases of the Heart	14	24.1
	4. Accidents	12	20.6
	5. Pneumonia and Influenza	5	8.6
	All Causes	599	1,029.4
1-4 Years	1. Accidents	42	18.2
	2. Congenital Anomalies	19	8.2
	3. Malignant Neoplasms	10	4.3
	4-5. Meningitis - Diseases of the Heart	5	2.2
	All Causes	113	48.8
5-14 Years	1. Accidents	94	16.3
	2. Malignant Neoplasms	20	3.5
	3. Congenital Anomalies	10	1.7
	4-5. Suicide - Diseases of the Heart	3	0.5
	All Causes	154	26.7
15-24 Years	1. Accidents	478	74.5
	2. Suicide	147	22.9
	3. Homicide	60	9.3
	4. Malignant Neoplasms	54	8.4
	5. Diseases of the Heart	21	3.3
	All Causes	864	134.6
25-34 Years	1. Accidents	361	54.2
	2. Suicide	195	29.3
	3. Malignant Neoplasms	104	15.6
	4. Diseases of the Heart	57	8.6
	5. Homicide	52	7.8
	All Causes	1,017	152.8

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

WHITE MALES[2]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[1]
35-49 Years	1. Diseases of the Heart	596	81.7
	2. Malignant Neoplasms	395	54.1
	3. Accidents	258	35.4
	4. Suicide	151	20.7
	5. Chronic Liver Diseasa and Cirrhosis	105	14.4
	All Causes	1,957	268.2
50-64 Years	1. Diseases of the Heart	2,774	518.5
	2. Malignant Neoplasms	2,225	415.9
	3. Cerebrovascular Diseases	241	45.0
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	230	43.0
	5. Chronic Liver Disease and Cirrhosis	216	40.4
	All Causes	6,944	1,298.0
65 and Over	1. Diseases of the Heart	10,387	2,747.0
	2. Malignant Neoplasms	5,258	1,390.6
	3. Cerebrovascular Diseases	1,557	411.8
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	1,379	364.7
	5. Pneumonia and Influenza	927	245.2
	All Causes	23,850	6,307.6

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

BLACK MALES¹			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE²
All Ages	1. Diseases of the Heart	1,900	329.1
	2. Malignant Neoplasms	1,308	226.6
	3. Homicide	655	113.5
	4. Accidents	301	52.1
	5. Cerebrovascular Diseases	296	51.3
	All Causes	6,378	1,104.8
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	208	1,877.3
	2. Congenital Anomalies	32	288.8
	3-4. Nephritis - Diseases of the Heart	4	36.1
	5-6. Cerebrovascular Diseases - Homicide	3	27.1
	All Causes	317	2,861.0
1-4 Years	1. Accidents	14	31.1
	2. Homicide	7	15.6
	3. Diseases of the Heart	3	6.7
	4. Certain Conditions Originating in the Perinatal Period	2	4.4
	5-11. Chronic Obstructive Pulmonary Diseases and Allied Conditions - Meningitis - Malignant Neoplasms Hepatitis - Septecaemia - Meningococcal Infection - Congenital Anomalies	1	2.2
	All Causes	40	88.9
5-14 Years	1. Accidents	29	24.8
	2. Homicide	9	7.7
	3. Malignant Neoplasms	6	5.1
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	3	2.6
	5-6. Congenital Anomalies - Anemia	2	1.7
	All Causes	57	48.7
15-24 Years	1. Homicide	227	198.3
	2. Accidents	47	41.1
	3. Suicide	17	14.9
	4. Diseases of the Heart	11	9.6
	5. Malignant Neoplasms	10	8.7
	All Causes	340	297.1
25-34 Years	1. Homicide	212	221.3
	2. Accidents	54	56.4
	3. Diseases of the Heart	32	33.4
	4-5. Chronic Liver Disease and Cirrhosis - Suicide	26	27.1
	All Causes	492	513.5

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

BLACK MALES[1]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[2]
35-49 Years	1. Diseases of the Heart	162	180.3
	2. Homicide	120	133.5
	3. Malignant Neoplasms	91	101.3
	4. Chronic Liver Disease and Cirrhosis	80	89.0
	5. Accidents	66	73.4
	All Causes	827	920.2
50-64 Years	1. Diseases of the Heart	519	823.4
	2. Malignant Neoplasms	453	718.7
	3. Cerebrovascular Diseases	67	106.3
	4. Chronic Liver Disease and Cirrhosis	61	96.8
	5. Homicide	58	92.0
	All Causes	1,459	2,314.8
65 and Over	1. Diseases of the Heart	1,169	2,843.0
	2. Malignant Neoplasms	740	1,799.7
	3. Cerebrovascular Diseases	183	445.1
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	95	231.0
	5. Pneumonia and Influenza	89	216.5
	All Causes	2,846	6,921.5

Table 2.8
Leading Causes of Death and Cause-Specific Rates
by Age, Sex, and Race,
Michigan Residents, 1986 (Continued)

WHITE FEMALES[1]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[2]
All Ages	1. Diseases of the Heart	13,615	341.8
	2. Malignant Neoplasms	6,899	173.2
	3. Cerebrovascular Diseases	2,859	71.8
	4. Pneumonia and Influenza	1,160	29.1
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	997	25.0
	All Causes	33,094	830.7
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	201	363.6
	2. Congenital Anomalies	90	162.8
	3. Accidents	8	14.5
	4. Diseases of the Heart	6	10.9
	5. Pneumonia and Influenza	4	7.2
	All Causes	397	718.2
1-4 Years	1. Accidents	30	13.7
	2. Congenital Anomalies	22	10.0
	3. Malignant Neoplasms	10	4.6
	4-5. Diseases of the Heart - Meningitis	4	1.8
	All Causes	93	42.4
5-14 Years	1. Accidents	40	7.3
	2. Malignant Neoplasms	21	3.9
	3. Congenital Anomalies	9	1.7
	4. Homicide	4	0.7
	5-6. Diseases of the Heart - Cerebrovascular Diseases	3	0.6
	All Causes		
15-24 Years	1. Accidents	165	26.3
	2. Malignant Neoplasms	29	4.6
	3. Suicide	26	4.1
	4. Homicide	17	2.7
	5. Diseases of the Heart	15	2.4
	All Causes	318	50.8
25-34 Years	1. Accidents	86	13.0
	2. Malignant Neoplasms	80	12.1
	3. Suicide	36	5.4
	4. Diseases of the Heart	32	4.8
	5. Homicide	16	2.4
	All Causes	371	55.9

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

WHITE FEMALES[2]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[3]
35-49 Years	1. Malignant Neoplasms	479	64.3
	2. Diseases of the Heart	180	24.2
	3. Accidents	95	12.7
	4. Suicide	81	10.9
	5. Cerebrovascular Diseases	54	7.2
	All Causes	1,176	157.8
50-64 Years	1. Malignant Neoplasms	1,813	315.8
	2. Diseases of the Heart	1,152	200.6
	3. Cerebrovascular Diseases	196	34.1
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	170	29.6
	5. Diabetes Mellitus	112	19.5
	All Causes	4,295	748.1
65 and Over	1. Diseases of the Heart	12,222	2,201.1
	2. Malignant Neoplasms	4,466	804.3
	3. Cerebrovascular Diseases	2,588	466.1
	4. Pneumonia and Influenza	1,059	190.7
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	802	144.4
	All Causes	26,338	4,743.4

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1986 (Continued)

BLACK FEMALES[2]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[3]
All Ages	1. Diseases of the Heart	1,815	279.2
	2. Malignant Neoplasms	977	150.3
	3. Cerebrovascular Diseases	381	58.6
	4. Homicide	141	21.7
	5. Certain Conditions Originating in the Perinatal Period	140	21.5
	All Causes	4,904	754.3
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	140	1,290.9
	2. Congenital Anomalies	25	230.5
	3. Diseases of the Heart	5	46.1
	4. Homicide	4	36.9
	5-7. Nephritis, Nephrotic Syndrome and Nephrosis - Accidents - Pneumonia and Influenza	2	18.4
	All Causes	235	2,166.9
1-4 Years	1. Accidents	10	22.8
	2. Homicide	4	9.1
	3. Congenital Anomalies	3	6.9
	4-5. Diseases of the Heart - Pneumonia and Influenza	2	4.6
	All Causes	30	68.5
5-14 Years	1. Accidents	13	11.3
	2. Malignant Neoplasms	7	6.1
	3. Homicide	5	4.3
	4. Congenital Anomalies	3	2.6
	5-9. Diseases of the Heart - Chronic Obstructive Pulmonary Diseases and Allied Conditions - Pneumonia and Influenza - Nephritis Nephrotic Syndome and Nephrosis - Anemia	1	0.9
	All Causes	43	37.3
15-24 Years	1. Homicide	39	32.5
	2. Accidents	12	10.0
	3-4 Suicide - Complications of Pregnancy	4	3.3
	5. Malignant Neoplasms	3	2.5
	All Causes	88	73.4
25-34 Years	1. Homicide	37	31.9
	2. Malignant Neoplasms	26	22.4
	3. Diseases of the Heart	20	17.3
	4. Accidents	16	13.8
	5. Chronic Liver Disease and Cirrhosis	12	10.4
	All Causes	211	182.2

Table 2.8
Leading Causes of Death and Cause-Specific Rates
by Age, Sex, and Race,
Michigan Residents, 1986 (Continued)

BLACK FEMALES[1]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE[1]
35-49 Years	1. Malignant Neoplasms	119	107.4
	2. Diseases of the Heart	75	67.7
	3. Homicide	39	35.2
	4. Cerebrovascular Diseases	25	22.6
	5. Chronic Liver Disease and Cirrhosis	22	19.9
	All Causes	437	394.5
50-64 Years	1. Diseases of the Heart	329	433.5
	2. Malignant Neoplasms	315	415.1
	3. Cerebrovascular Diseases	80	105.4
	4. Diabetes Mellitus	40	52.7
	5. Pneumonia and Influenza	24	31.6
	All Causes	1,005	1,324.3
65 and Over	1. Diseases of the Heart	1,382	2,389.8
	2. Malignant Neoplasms	506	875.0
	3. Cerebrovascular Diseases	272	470.4
	4. Pneumonia and Influenza	81	140.1
	5. Diabetes Mellitus	78	134.9
	All Causes	2,855	4,937.0

DISEASES OF THE HEART

The leading cause of death, heart disease, caused the death of 31,270 Michigan residents in 1986. That was more than the number of deaths from the next four largest categories combined. There were 652 more deaths from heart disease in 1986 than in 1985. The crude rate of 342.0 deaths per 100,000 population from this cause in 1986 is 1.5 percent higher than the rate of 336.9 in 1985.

The median age of persons who died from heart disease was 77 years, compared to a median of 73 years for deaths from all causes. Of the 31,270 deaths due to diseases of the heart, 50.6 percent were to males. The median age at death for males was 73 years compared to 81 years for females. The median age of 73 years for white males exceeded that for black males by 4 years and that for males of other races by 7 years. The median age at death for white females was 81 years, 6 years above that for black females and 5 years above that for females of other races (Table 2.9).

Table 2.10 presents death rates for diseases of the heart by age, race and sex. Note that the death rate associated with this cause rose markedly with advancing age. Heart disease was the underlying cause of death for 43 persons below 5 years of age or about 2.3 percent of all deaths in this age group. In contrast, 50.6 percent of all deaths in the age group 85 and over were attributed to this cause in 1986. The heart disease death rate was 7,897.5 per 100,000 persons over 84 years of age in 1986.

Examination of Table 2.10 reveals that the heart disease death rate for males was greater than that for females (355.2 compared to 329.4 per 100,000 population). The relationship between rates for males and females is graphically displayed in Figure 2.6. The age-specific heart disease death rates for males were higher than female rates for all age groups except 1 to 14 years olds where the rates are equal. The greatest relative differentials occurred from age 35 through 64 with rates for males ranging from 2.4 to 3.3 times the corresponding rates for females. The gap between rates for males and females became progressively smaller after age 64. Among persons 85 years of age or over the rate of 8505.4 for males was 11.3 percent above that for females (7,644.4). The age-adjusted death rate for males was 1.8 times that for females.

A comparison of 1986 heart disease death rates for males by race is graphically presented in Figure 2.7. Rates for black males were higher than those for white males for all age intervals below 85 for which rates can be calculated. The rate for white males across all ages was 363.2 compared to 329.1 for black males. This differential stems mostly from the fact that a greater proportion of the white male population was in the older age groups where heart disease death rates were particularly high. The age-adjusted heart disease death rate for white males in 1986 was 24.1 percent below the rate for black males.

Heart disease death rates for white and black females are displayed in Figure 2.8. Rates for black females were greater than those for white females for ages below 85 for which rates can be calculated with the relative differentials steadily decreasing with advancing age. Beyond age 84 the rate for white females exceeded that for black females by 13.0 percent.

Table 2.9
Deaths Due to Diseases of the Heart by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	29	18	11	20	14	6	9	4	5	-	-	-
1-4	14	8	6	9	5	4	5	3	2	-	-	-
5-9	5	1	4	4	1	3	1	-	1	-	-	-
10-14	2	2	-	2	2	-	-	-	-	-	-	-
15-19	20	13	7	18	11	7	1	1	-	1	1	-
20-24	29	20	9	18	10	8	11	10	1	-	-	-
25-29	46	26	20	28	17	11	17	9	8	1	-	1
30-34	97	64	33	61	40	21	35	23	12	1	1	-
35-39	201	159	42	138	113	25	60	44	16	3	2	1
40-44	339	252	87	250	191	59	85	57	28	4	4	-
45-49	487	359	128	388	292	96	92	61	31	6	5	1
50-54	837	598	239	639	476	163	194	118	76	4	4	-
55-59	1,515	1,072	443	1,238	903	335	275	168	107	2	1	1
60-64	2,439	1,635	804	2,049	1,395	654	379	233	146	10	6	4
65-69	3,246	2,030	1,216	2,763	1,769	994	477	257	220	6	4	2
70-74	4,133	2,453	1,680	3,637	2,181	1,456	486	264	222	10	8	2
75-79	4,764	2,361	2,403	4,224	2,118	2,106	531	241	290	9	2	7
80-84	4,870	2,145	2,725	4,401	1,934	2,467	459	203	256	10	8	2
85-89	4,158	1,472	2,686	3,835	1,352	2,483	318	117	201	4	3	1
90+	4,037	1,122	2,915	3,749	1,033	2,716	280	87	193	7	1	6
Not Stated	2	1	1	2	1	1	-	-	-	-	-	-
All Ages	31,270	15,811	15,459	27,473	13,858	13,615	3,715	1,900	1,815	78	50	28
Median Age At Last Birthday	77	73	81	78	73	81	72	69	75	70	66	76

[1] Deaths with race not stated are included only in the total column.

Table 2.10
Heart Disease Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	342.0	355.2	329.4	352.3	363.2	341.8	302.7	329.1	279.2
Under 1 Year	21.0	25.4	16.3	17.6	24.1	10.9	41.0	*	46.1
1-14 Years	1.1	1.1	1.1	1.0	1.0	0.9	1.9	*	*
15-24 Years	3.2	4.3	2.1	2.8	3.3	2.4	5.1	9.6	*
25-34 Years	9.1	11.7	6.7	6.7	8.6	4.8	24.6	33.4	17.3
35-44 Years	43.7	67.9	20.5	36.4	57.4	15.6	97.6	151.9	53.6
45-54 Years	148.3	220.7	79.9	131.4	200.4	65.0	284.7	398.8	192.6
55-64 Years	476.2	684.2	285.9	447.8	654.0	258.4	722.3	965.4	516.3
65-74 Years	1192.0	1646.1	835.3	1156.4	1620.6	791.1	1547.8	1921.4	1259.2
75-84 Years	3059.3	3798.3	2612.7	3024.9	3794.8	2564.0	3516.4	3972.4	3216.1
85 Years and Over	7897.5	8505.4	7641.4	8003.8	8648.9	7738.9	6972.1	7218.7	6851.0
Age-Adjusted Rate[2]	196.7	262.3	143.9	188.8	254.4	136.1	265.9	335.2	211.0

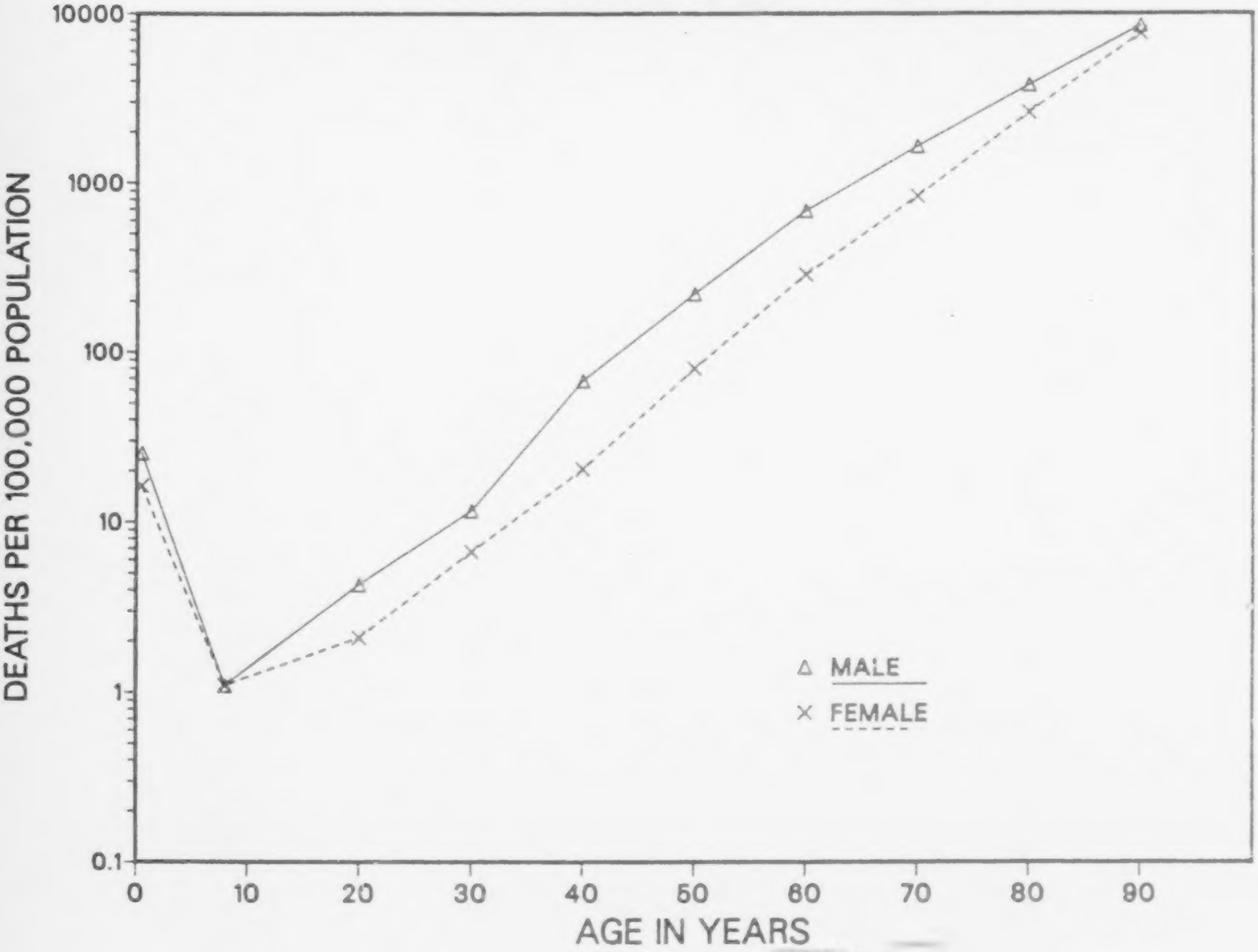
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.6
AGE-SPECIFIC HEART DISEASE DEATH RATES[1]
BY SEX, MICHIGAN RESIDENTS, 1986



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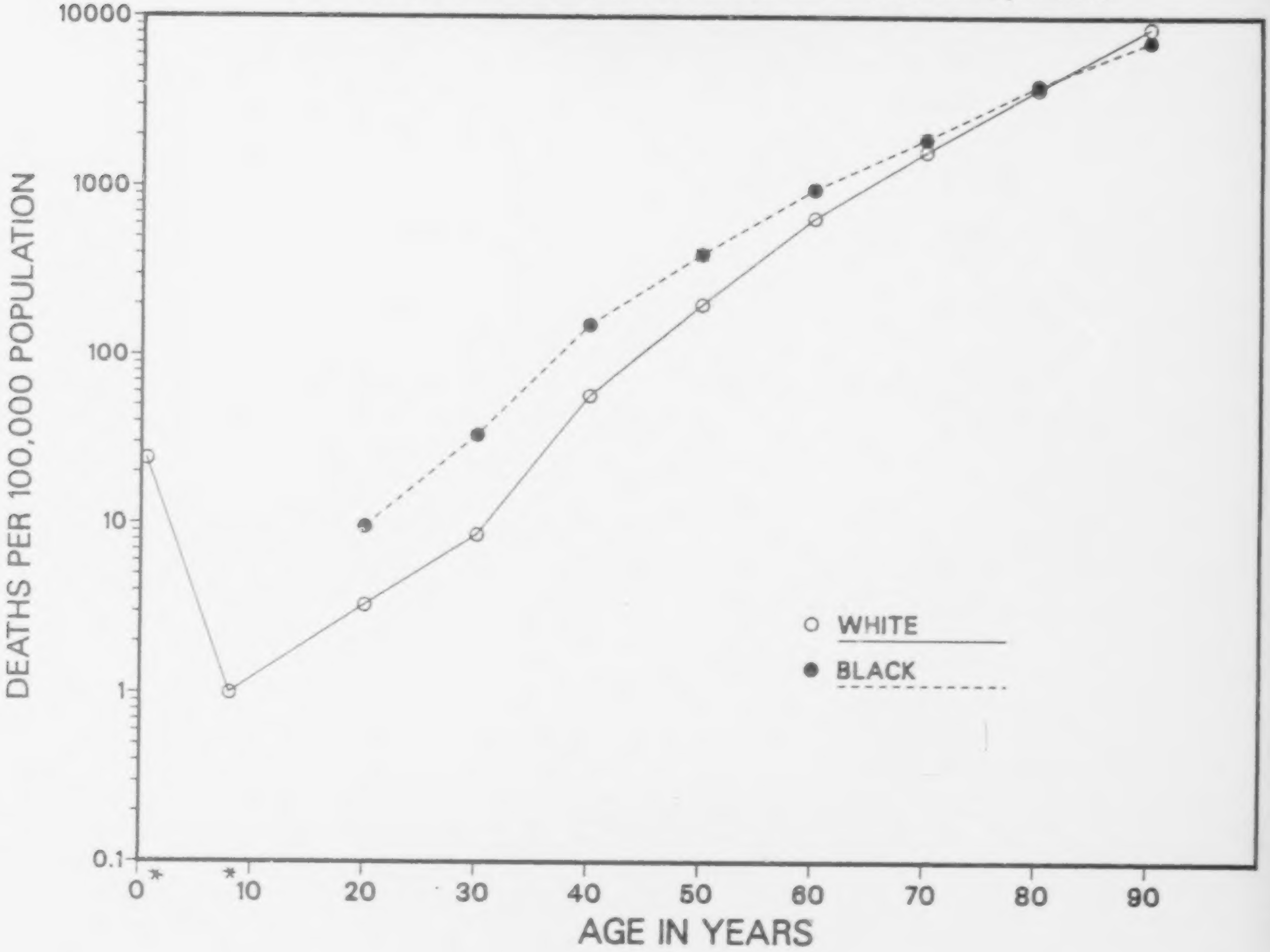
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.7

AGE-SPECIFIC HEART DISEASE DEATH RATES BY RACE,[1] MICHIGAN RESIDENT MALES, 1986



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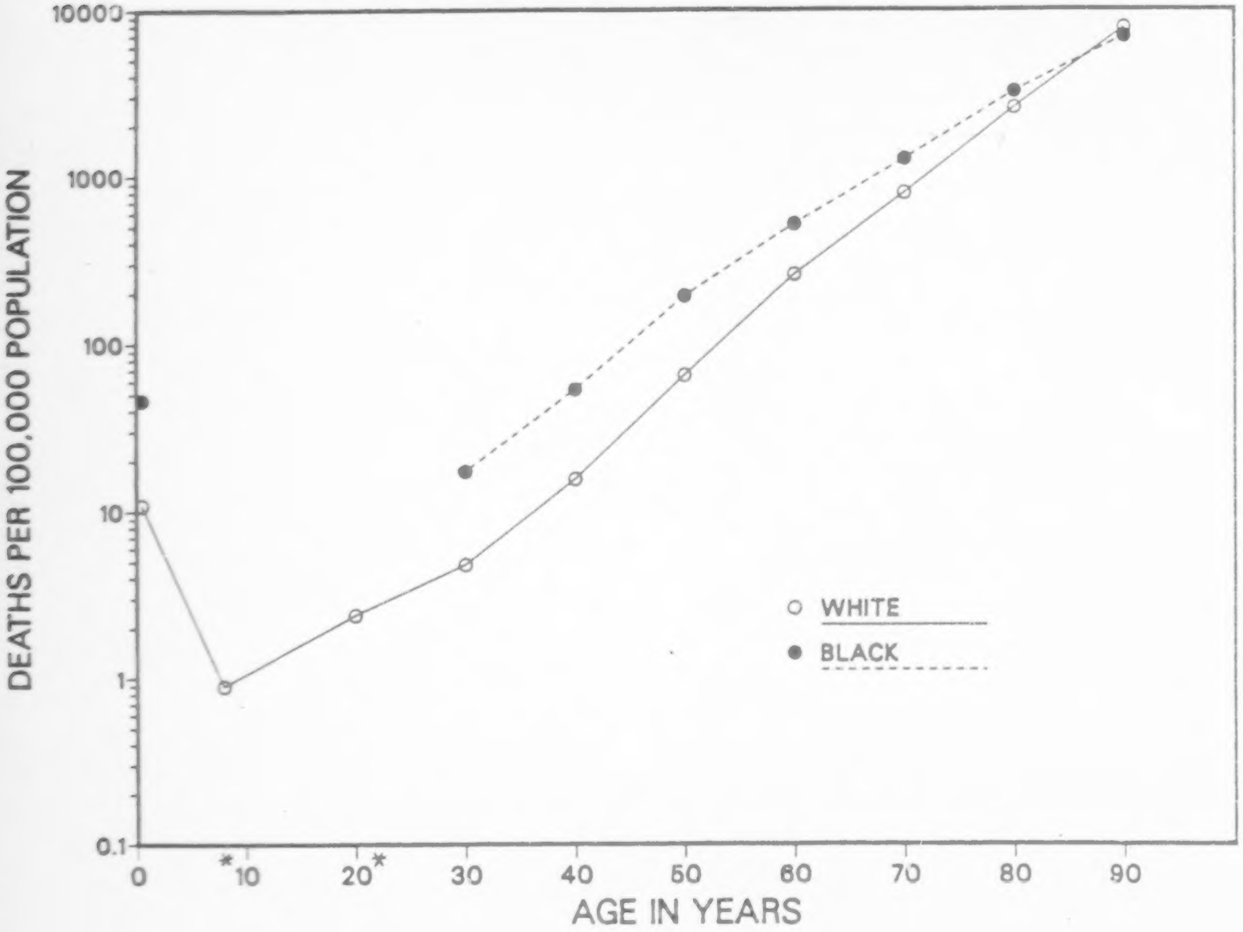
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.8

AGE-SPECIFIC HEART DISEASE DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1986



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[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

Although the rate for white females of all ages (341.8) was greater than the comparable rate for black females (279.2), this relationship is reversed when the differing age distributions of the two populations are considered. The age-adjusted rate for black females was 55.0 percent higher than that for white females.

In 1900 the crude heart disease death rate in Michigan was 117.1, the lowest rate of this century (Figure 2.9). Heart disease death rates rose through the time period 1900-1950, remained relatively stable between 1950 and 1961, peaked between 1962 and 1972, decreased between 1973 and 1979 and increased after 1979. The highest rate observed during the century was 343.1 in 1965. The rate of 342.0 for 1986 was 0.3 percent below the peak rate observed in 1965.

The heart disease death rate for Michigan was consistently close to the national rate until 1947. From 1947 through 1981 the crude rate for Michigan was below that of the nation but by a progressively lesser degree in later years. From 1982 through 1986 rates for Michigan were above the national rates with the 1986 Michigan rate of 342.0, 7.3 percent above the national provisional rate of 318.7.

Age-adjusted death rates for diseases of the heart since 1970 are presented in Table 2.11. These data indicate a downward trend in heart disease death rates for the Michigan population as a whole and for white males and females. Between 1970 and 1975 the rates decreased for other than white males and females. However, since 1975 the rates have been generally increasing for the two groups.

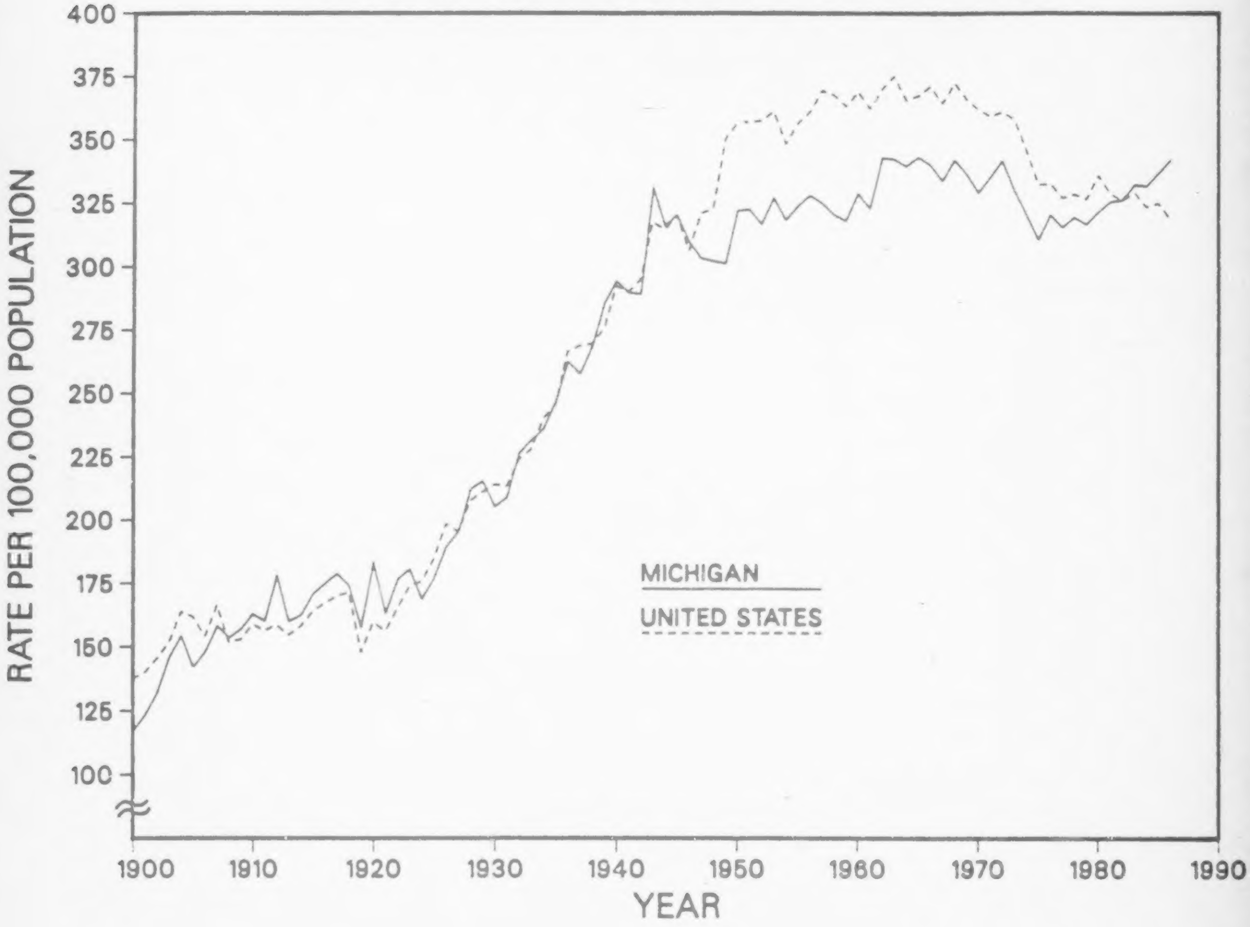
Between 1970 and 1972 the overall rate for Michigan remained constant. Since 1972 the rate has declined each year, with the exception of 1976 and 1984. The age-adjusted death rate for the nation declined each year between 1970 and 1986 except 1980. The age-adjusted rate for Michigan declined by 24.5 percent between 1970 and 1986 whereas the age-adjusted rate for the nation declined by 30.8 percent (see Technical Notes). Since 1970, the age-adjusted rate for Michigan has been above that for the nation consistently with the 1986 Michigan rate 12.1 percent above the national provisional rate.

Age-adjusted rates for other than white females have been well above those for white females in both Michigan and the United States. In 1986 the Michigan age-adjusted heart disease death rate for other than white females exceeded the rate for white females by 48.1 percent.

In Michigan age-adjusted rates for other than white males were less than those for white males for most years between 1970 and 1977. After 1977 the Michigan rates for other than white males have been greater than rates for white males. In 1986 the rate for other than white males was 26.6 percent higher than the rate for white males. Nationally the rates were highest for other than white males, next highest for white males, then for other than white females and lowest for white females each year from 1970 to 1985.

The most prevalent type of heart disease death was old myocardial infarction and other forms of chronic ischemic heart disease (10,997 deaths) in 1986 (Table 2.12). The second most frequent was acute myocardial infarction, commonly referred to as a "coronary". In 1986 there were 10,763 deaths attributed to this cause. Together, these causes accounted for 69.6 percent of all Michigan resident deaths from heart disease. Of the remaining 9,510 heart disease deaths,

FIGURE 2.9
HEART DISEASE DEATH RATES,[1] MICHIGAN AND UNITED STATES RESIDENTS, 1900-1986[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1986 United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] Heart Disease death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.11

Age-Adjusted Heart Disease Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich	1970	260.4	352.2	181.2	257.0	352.5	175.1	280.6	336.6	230.2
	1971	259.7	358.7	175.5	255.9	359.0	168.8	281.8	339.7	229.4
	1972	260.5	355.2	180.3	256.7	353.9	174.7	284.1	356.1	220.6
	1973	247.7	339.2	170.8	243.6	337.8	165.0	273.0	340.4	213.9
	1974	235.6	321.7	163.7	232.6	321.8	158.2	253.8	311.5	203.8
	1975	226.2	312.2	154.5	224.7	313.6	150.8	231.3	290.6	180.2
	1976	228.0	316.6	155.4	225.7	316.9	151.2	241.8	306.6	186.8
	1977	221.5	308.4	150.7	218.2	308.1	145.1	242.6	302.1	192.1
	1978	219.0	302.4	151.2	214.9	301.0	145.2	247.8	307.9	197.8
	1979	215.4	298.5	148.5	211.2	296.2	143.0	243.2	310.7	187.7
	1980	214.9	295.5	150.6	210.0	292.2	144.4	249.5	317.5	195.2
	1981	204.4	288.9	138.9	201.2	287.3	132.7	230.7	294.5	179.8
	1982	199.7	279.8	138.6	196.4	278.0	132.2	227.5	287.9	180.2
	1983	198.6	273.3	141.1	195.1	271.0	134.8	229.7	286.0	185.6
	1984	200.5	271.7	145.5	194.5	265.7	138.4	249.0	313.3	197.1
	1985	199.8	272.2	141.9	193.1	265.5	135.3	247.8	321.1	189.4
	1986	196.7	262.3	143.9	188.8	254.4	136.1	254.9	322.0	201.5
U S	1970	253.6	348.5	175.2	249.1	347.6	167.8	288.9	350.8	236.6
	1971	249.3	344.1	171.7	245.1	343.5	164.8	280.3	343.2	227.8
	1972	247.9	343.1	170.3	243.5	341.8	163.4	281.1	348.7	225.8
	1973	242.4	337.3	165.5	237.9	336.0	158.7	276.9	343.6	222.5
	1974	230.3	321.3	157.1	226.4	320.3	150.8	259.7	325.1	206.8
	1975	217.8	305.7	147.4	214.5	305.1	141.9	241.8	305.9	190.1
	1976	213.6	300.2	144.4	210.4	299.6	139.2	237.0	301.6	185.1
	1977	206.9	291.3	139.9	203.3	290.2	134.4	233.0	296.3	182.4
	1978	203.8	286.2	138.5	200.2	284.7	133.3	229.4	294.6	178.1
	1979	199.5	278.9	136.8	195.6	276.8	131.3	227.4	291.8	177.3
	1980	202.0	280.4	140.3	197.6	277.5	134.6	234.2	299.6	183.5
	1981	195.0	271.2	135.1	191.1	268.8	129.8	222.6	286.1	173.5
	1982	190.5	264.4	132.5	186.8	262.1	127.4	215.8	278.7	167.9
	1983	188.8	260.4	132.3	184.6	257.8	126.7	217.8	277.4	171.8
	1984	183.6	252.2	129.3	179.5	249.5	124.0	211.2	268.8	166.8
	1985	180.5	247.7	127.3	176.1	244.5	121.7	210.4	268.4	165.8
	1986[3]	175.4	---	---	---	---	---	---	---	---

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[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes)

[3] Provisional Data

Table 2.12

Deaths Due to Diseases of the Heart by Specific Cause, Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
139	Old Myocardial Infarction and Other Forms of Chronic Ischemic Heart Disease	10,997	35.2
136	Acute Myocardial Infarction	10,763	34.4
148	All Other and Ill-Defined Forms of Heart Disease	6,052	19.4
146	Heart Failure	1,620	5.2
133	Hypertensive Heart Disease	622	2.0
140	Diseases of Pulmonary Circulation	350	1.1
144	Aortic Valve Disorders	195	0.6
128	Diseases of Mitral Valve	92	0.3
135	Hypertensive Heart and Renal Disease	89	0.3
131	All Other Chronic Rheumatic Heart Disease	85	0.3
145	All Other Diseases of Endocardium	77	0.2
137	Other Acute and Subacute Forms of Ischemic Heart Disease	63	0.2
143	Mitral Valve Disorders	62	0.2
142	Acute Pericarditis, Acute Myocarditis, and Other Diseases of Pericardium	44	0.1
138	Angina Pectoris	42	0.1
141	Acute and Subacute Endocarditis	37	0.1
147	Myocarditis, Unspecified and Myocardial Degeneration	36	0.1
130	Diseases of Mitral and Aortic Valves	31	0.1
129	Diseases of Aortic Valve	11	0.0
127	Acute Rheumatic Fever	2	0.0
	Total	31,270	100.0

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[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

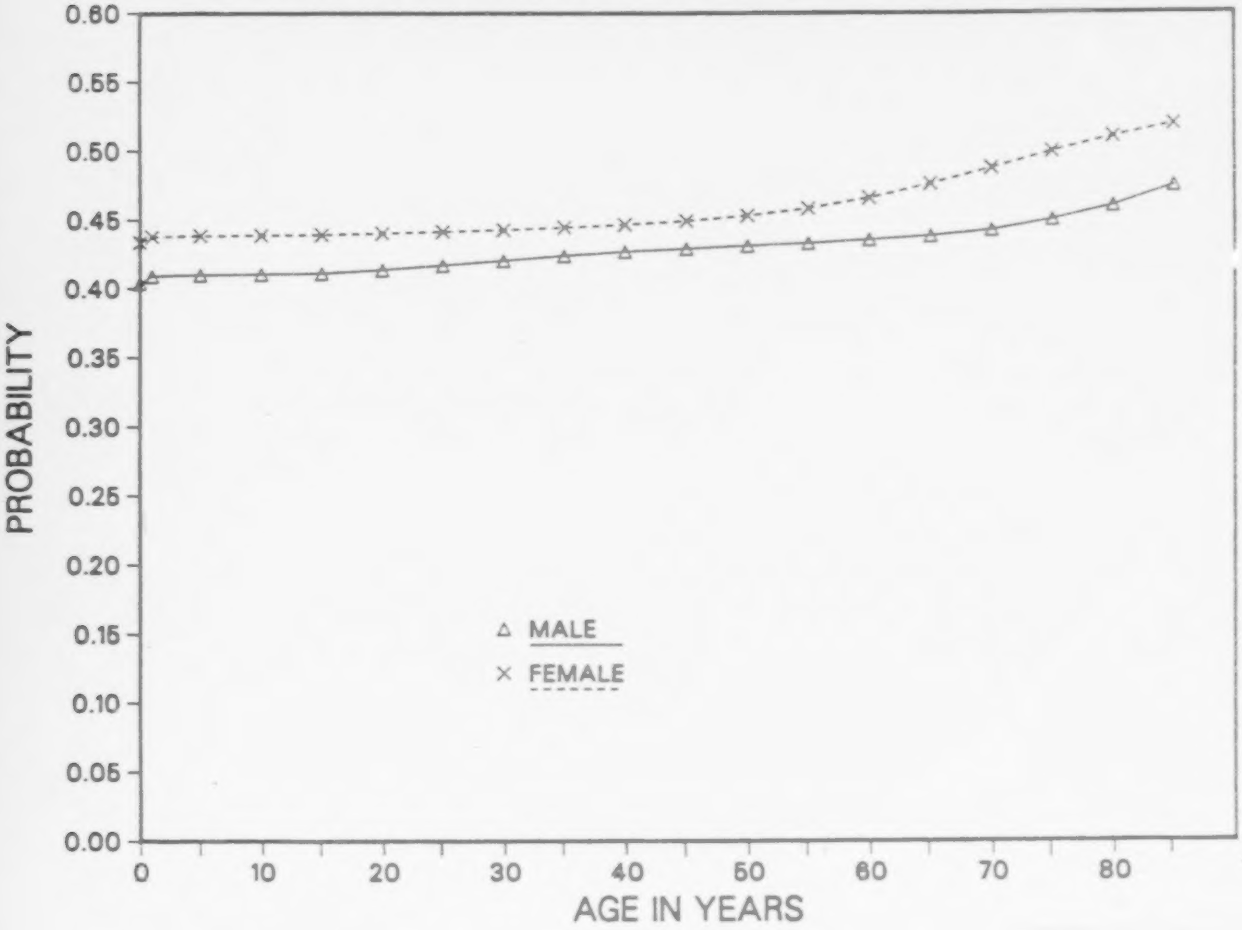
80.7 percent were attributed to all other and ill-defined forms of heart disease (6,052 deaths) and heart failure (1,620 deaths).

The probabilities of eventually dying from heart disease, based on Michigan resident death data from 1984, 1985 and 1986 were 0.404 for males and 0.434 for females at birth. The chance associated with dying from heart disease increases steadily for both sexes with advancing age as certain competing causes of death become less likely. By age 85 and above, the observed probability was 0.474 for males and 0.519 for females. At all ages the probability of death eventually being caused by heart disease was greater for females. These differentials by sex were smallest from ages 35 to 49. The higher probability for females reflects smaller chances of death due to some cause other than heart disease (Figure 2.10).

An apparent inconsistency can be noted by review of Figure 2.6 and Figure 2.10. The heart disease mortality rate for males was higher than that for females over nearly all ages, yet the chance of eventual death due to heart disease was slightly greater for females at all ages. This paradox is explained by a comparison of these two measures. The cause-specific mortality rate measures the proportion of a population that died from the particular cause over a certain period of time. The probability estimate takes into account the present age and cause-specific mortality rates and the life expectancy of the population. A greater proportion of all females now alive are expected to live into the older age intervals where they will be subject to the high heart disease mortality rates characteristic of those age groups. The effect of the longer female life span outweighs the effect of the higher mortality rate for males from heart disease.

FIGURE 2.10

PROBABILITY OF EVENTUALLY DYING FROM HEART DISEASE BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986 [1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CANCER

Of 80,177 Michigan resident deaths in 1986, 17,321 were attributed to cancer. Although not the leading cause of death in Michigan or the United States, cancer affects all the human body's major systems and persons of all ages. The frequency of death due to cancer was 55.4 percent of the number of deaths due to heart disease across all ages, but the number of cancer deaths below age 65 was greater than the number of deaths due to heart disease below age 65. The median age at death for cancer was 69 years, well below the median age of 77 years for heart disease deaths (Table 2.13).

Of the 17,321 cancer deaths in 1986 occurring to Michigan residents, 54.3 percent were to males. The median age at death was 69 years for white males and females. The median ages at death for black persons who died of cancer were 67 years for males and 65 years for females. The median age at death for persons of all other races was 69 years for males and 62 years for females.

Cancer death rates by age, race and sex are presented in Table 2.14. The cancer death rate across all ages in 1986 was higher for males (211.4) than for females (168.6). The cancer death rates displayed in Figure 2.11 show a strong increase in mortality with advancing age. Mortality rates for males were lower than those for females below age 15 and between 35 through 44 years of age. Rates for males were higher than those of females between 15 and 34 years of age and age 45 and above. After 44 years of age the relative differential increased steadily, from 5.1 percent in the 45-54 year age group to 113.7 percent in the age group 85 years and over. The age-adjusted cancer death rate for males was 48.8 percent above that for females.

Cancer death rates for white and black males recorded in Table 2.14 are graphically displayed in Figure 2.12. Except for persons 25 to 34 years of age, rates for black males exceeded those for white males at all ages with sufficient data to calculate rates. The largest relative differential occurred in the age group 45-54 years, where the rate for black males exceeded by 129.5 percent the rate for white males. The crude death rate for black males (226.7) was above the corresponding rates for white (211.4) males. The age-adjusted cancer death rate for black males was 49.8 percent above the rate for white males.

The age specific cancer death rates for black females were above those for white females at all ages with sufficient data to calculate rates (Figure 2.13). The rates for black females were 85.1 percent higher than the rates for white females at age 25-34. This is different from the experience of black males age 25-34 who died less frequently than their white counterparts. The differential in rates for white and black females steadily decreased with advancing age. The crude rate for white females was 15.3 percent higher than the crude rate for black females. The age-adjusted rate for black females, however, was 28.0 percent greater than that for white females.

Among the major cause of death categories, cancer death rates have increased most persistently during the 20th century (Figure 2.14). In 1986, the crude cancer death rate decreased for the first time since 1974. The 1986 rate of 189.4 was 0.4 percent lower than the 1985 rate. The lowest observed rate for Michigan was 59.3 in 1902.

Table 2.13
Deaths Due to Cancer by Age, Race, and Sex[1], Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	2	1	1	2	1	1	-	-	-	-	-	-
1-4	22	11	11	20	10	10	2	1	1	-	-	-
5-9	31	16	15	23	12	11	8	4	4	-	-	-
10-14	24	10	14	18	8	10	5	2	3	1	-	1
15-19	36	26	10	30	21	9	6	5	1	-	-	-
20-24	60	38	22	53	33	20	7	5	2	-	-	-
25-29	101	56	45	87	53	34	14	3	11	-	-	-
30-34	121	56	65	97	51	46	19	4	15	5	1	4
35-39	233	92	141	189	74	115	43	18	25	1	-	1
40-44	341	151	190	267	122	145	72	28	44	2	1	1
45-49	519	246	273	418	199	219	95	45	50	5	2	3
50-54	910	466	444	724	360	364	184	105	79	2	1	1
55-59	1,595	916	679	1,338	768	570	249	145	104	8	3	5
60-64	2,321	1,306	1,015	1,976	1,097	879	335	203	132	9	5	4
65-69	2,726	1,512	1,214	2,322	1,279	1,043	395	230	165	8	3	5
70-74	2,783	1,606	1,177	2,474	1,403	1,071	302	199	103	6	4	2
75-79	2,251	1,272	979	2,003	1,117	886	240	150	90	7	4	3
80-84	1,694	898	796	1,517	803	714	172	91	81	5	4	1
85-89	999	494	505	901	438	463	93	53	40	5	3	2
90+	552	235	317	507	218	289	44	17	27	1	-	1
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	17,321	9,408	7,913	14,966	8,067	6,899	2,285	1,308	977	65	31	34
Median Age At Last Birthday	69	69	69	69	69	69	66	67	65	64	69	62

[1] Deaths with race or sex not stated are included only in the total column.

Table 2.14
Cancer Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	189.4	211.4	168.6	191.9	211.4	173.3	186.2	226.7	150.3
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	4.0	3.8	4.3	3.9	3.7	4.1	4.7	4.3	5.0
15-24 Years	6.3	8.4	4.2	6.5	8.4	4.6	5.5	8.7	*
25-34 Years	14.2	14.5	13.9	13.8	15.6	12.1	15.6	7.3	22.4
35-44 Years	46.5	40.1	52.5	42.7	37.0	48.3	77.4	69.2	84.1
45-54 Years	160.1	164.2	156.2	146.1	145.6	146.5	277.8	334.2	232.2
55-64 Years	471.6	561.6	389.7	451.5	530.8	378.6	645.0	837.8	481.6
65-74 Years	889.9	1144.9	689.7	866.9	1100.4	683.2	1120.3	1582.2	763.5
75-84 Years	1252.8	1829.2	901.3	1234.5	1798.1	897.1	1466.9	2165.2	1007.2
85 Years and Over	1494.3	2389.4	1121.7	1485.2	2376.9	1118.9	1597.3	2477.0	1165.0
Age-Adjusted Rate[2]	136.4	168.3	113.1	131.1	160.7	109.8	183.8	240.7	140.5

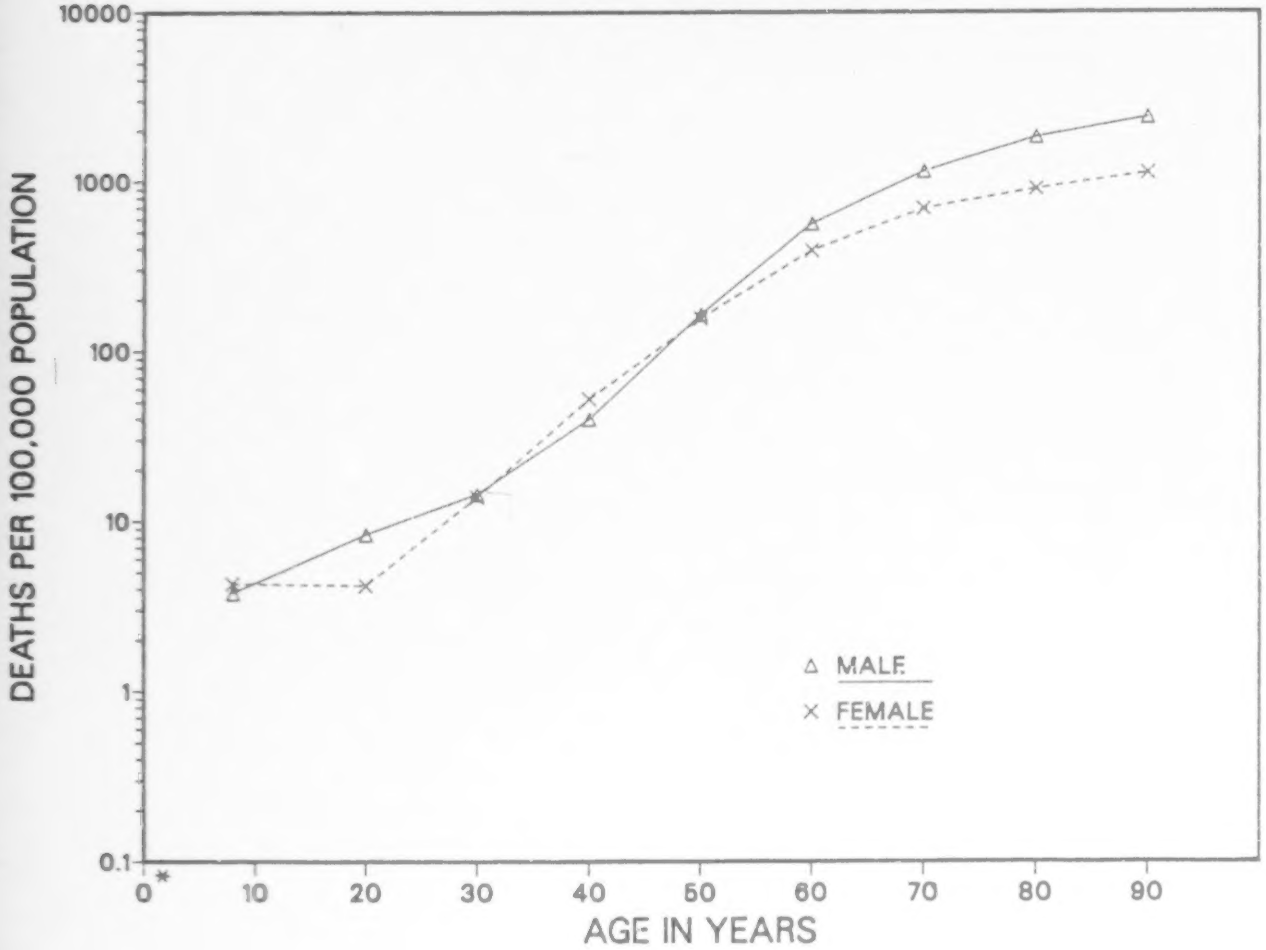
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.11
AGE-SPECIFIC CANCER DEATH RATES[1] BY SEX,
MICHIGAN RESIDENTS, 1986



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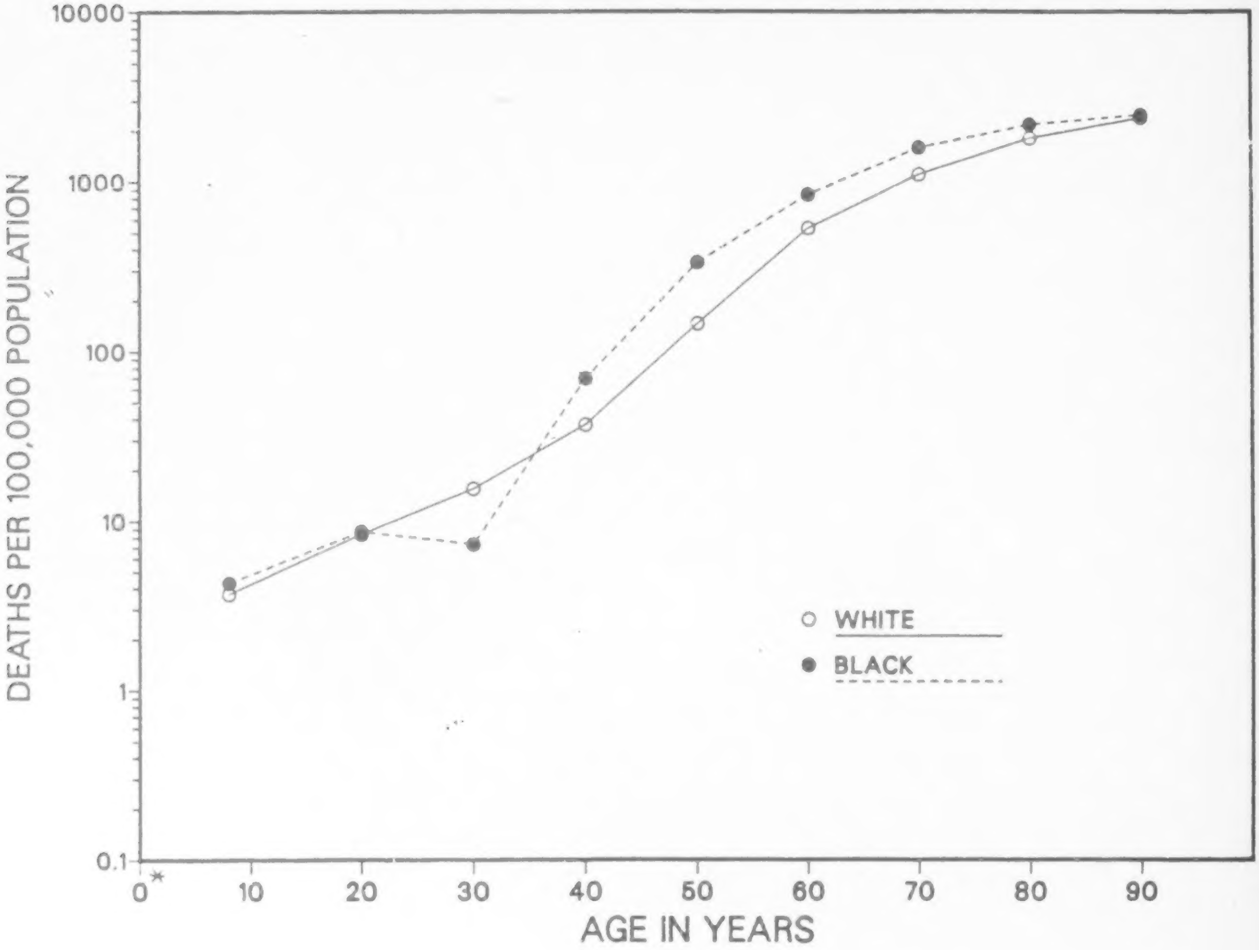
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.12

AGE-SPECIFIC CANCER DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1986



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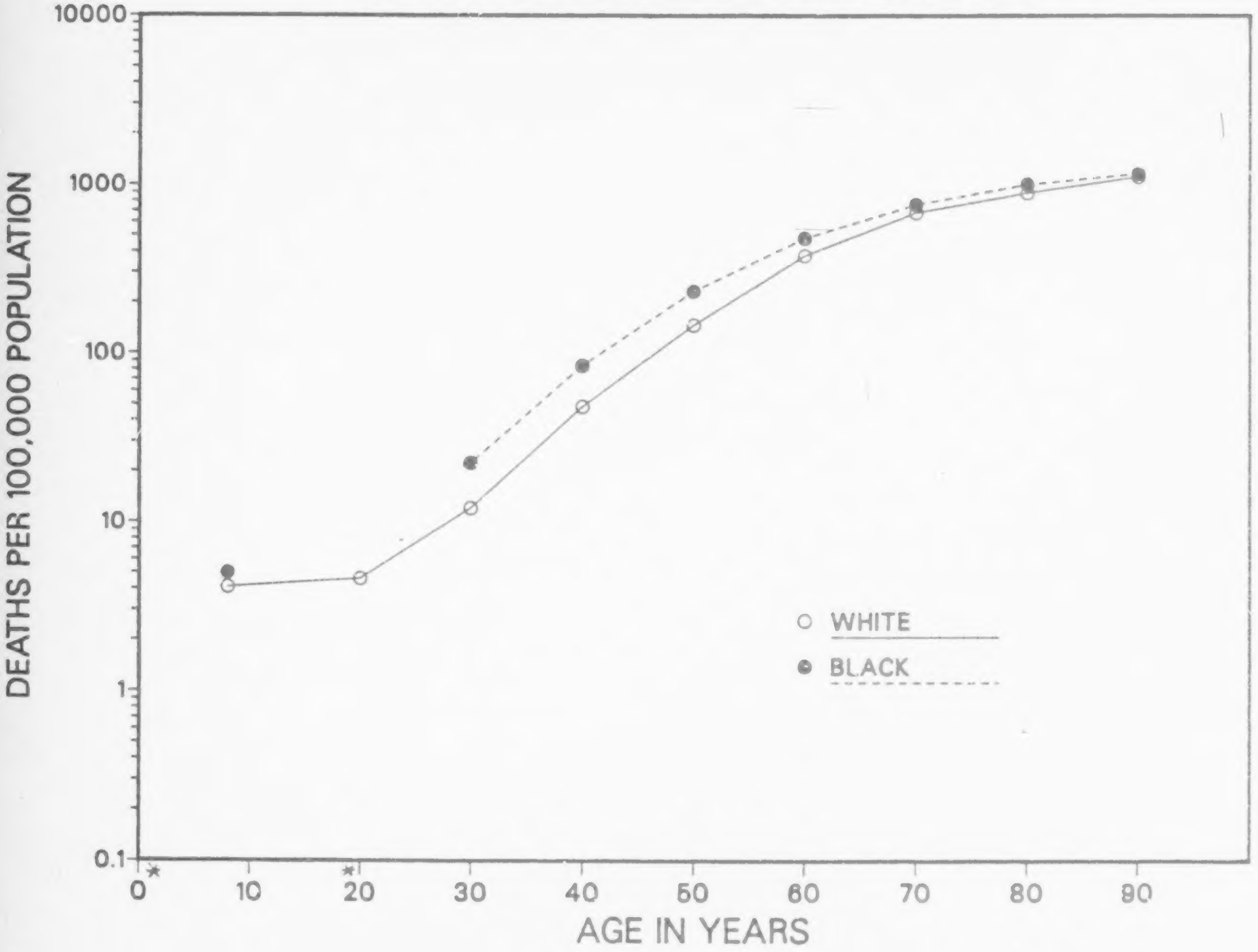
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.13
AGE-SPECIFIC CANCER DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1986



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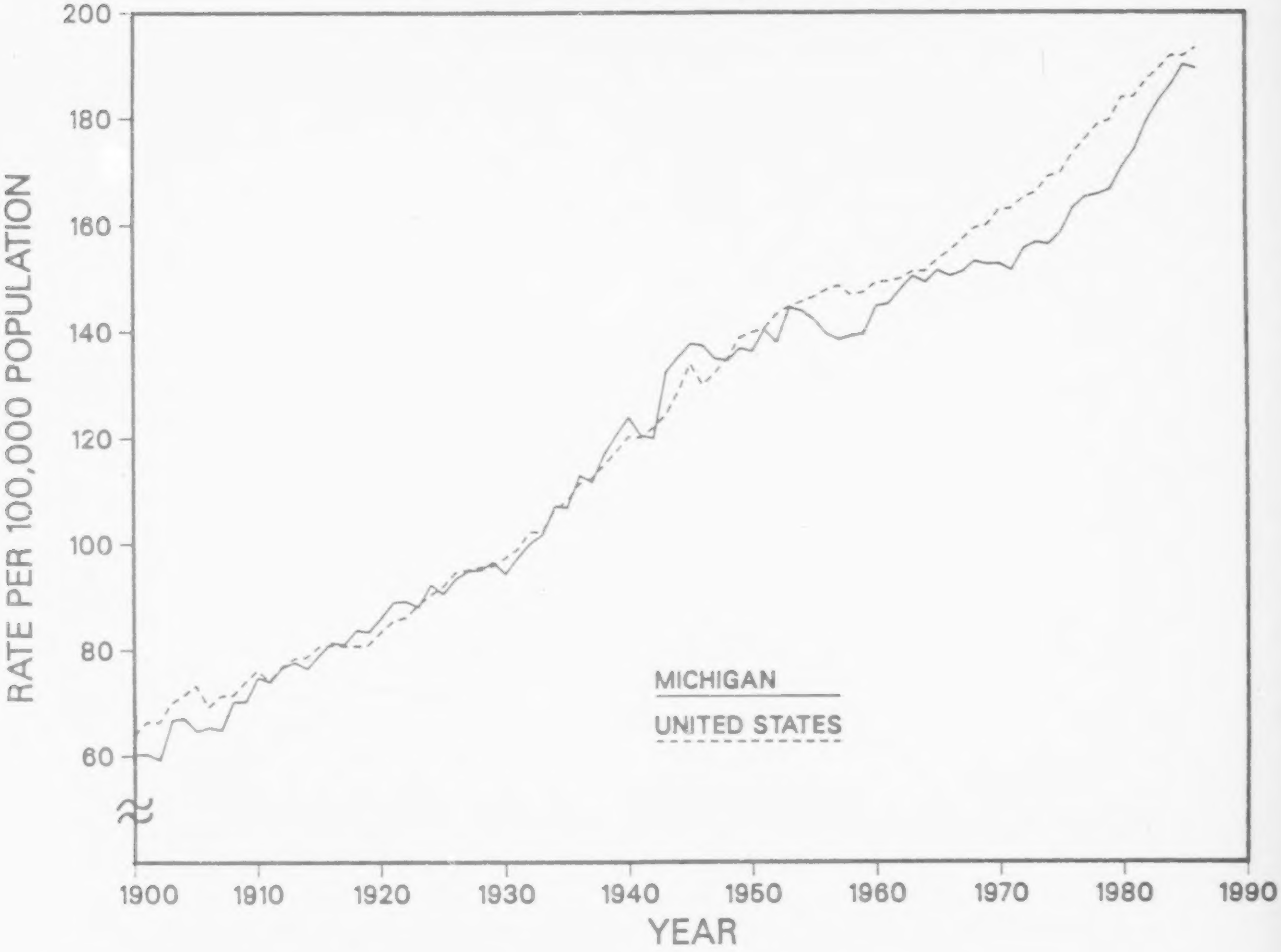
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.14
CANCER DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



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[1] National rates are from Death Registration States for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] Cancer death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Michigan's cancer death rate was less than the national rate from 1900 through 1915. During the period 1916 through 1947 Michigan's rate was generally close to the national rate. Since 1948, the state rate has been consistently less than the national cancer death rate. The national provisional cancer death rate in 1986 was 193.3, 2.1 percent above the state rate.

Age-adjusted cancer death rates for the years since 1970, presented in Table 2.15, show a much closer relationship between Michigan and United States mortality patterns than that indicated by crude mortality rates. While Michigan crude cancer death rates were consistently below the United States crude death rates from 1970 through 1986, Michigan age-adjusted rates were consistently higher than the United States age-adjusted rates during this time period. Michigan's 1970 age-adjusted rate for the total population was 3.7 percent higher than the comparable United States rate. From 1970 through 1983 Michigan's age-adjusted cancer death rate remained relatively stable. The rate rose 1.6 percent between 1983 and 1986. The United States rates remained stable from 1970 through 1979 and rose 1.3 percent between 1979 and 1986 (see Technical Notes).

Table 2.15 contains a comparison of age-adjusted cancer death rates for white males and females and other than white males and females. Nationally and in Michigan the 1970 through 1986 rates for the other than white groups were consistently higher than those for their white counterparts. Rates increased for other than white males nationally and in Michigan and for Michigan other than white females. Age-adjusted rates for other than white females were essentially stable in the nation. The rates for white males and females increased gradually in the United States while the rates for their Michigan counterparts remained stable.

The numbers of deaths from cancer for 49 different sites are presented in Table 2.16. Malignant neoplasms of the trachea, bronchus, and lung were the underlying cause of 4,554 deaths, 26.3 percent of all cancer deaths. Cancer of female breast was the second leading cause of cancer mortality (1,546 deaths). The third most frequent category of cancer mortality was cancer of other and unspecified parts of the colon (1,542). The total number of deaths attributed to colon cancer was 1,717. Malignant neoplasms of the prostate and the pancreas caused 1,001 and 729 deaths, respectively. There were 22 other categories which had at least 100 deaths in 1986.

Based upon 1984 through 1986 death data, the probability of death due to cancer is 0.222 for males and 0.191 for females at birth (Figure 2.15). The probability of eventually dying from cancer is greater for males than for females at all ages. The probability for males rises slowly to a peak of 0.234 by age 54 then declines to 0.135 at age 85 and above. Probabilities for females display little change from birth to age 49, then diminish to 0.084 by age 85. This decreasing probability beyond age 49, noting the high cancer mortality rates of older ages (Figure 2.11), indicates that age-specific death rates due to competing causes of death, such as heart disease, cerebrovascular disease and pneumonia and influenza, increase relatively faster with advancing age.

Table 2.15
Age-Adjusted Cancer Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	134.7	164.7	110.1	131.9	160.2	109.1	159.4	206.6	117.1
	1971	131.6	159.0	109.7	128.6	154.8	107.9	158.3	197.3	123.7
	1972	133.8	163.2	111.0	130.6	159.3	108.6	161.2	196.6	130.9
	1973	133.8	163.1	110.7	130.7	158.7	108.9	159.9	202.3	123.9
	1974	131.9	160.6	109.6	129.0	156.1	108.2	155.9	198.7	119.8
	1975	131.7	161.6	108.9	128.1	155.4	107.7	162.1	215.2	117.7
	1976	134.1	165.5	110.2	130.7	159.6	109.0	163.0	215.8	119.1
	1977	134.5	168.8	108.5	130.5	162.5	106.5	168.6	272.1	125.1
	1978	133.7	166.7	109.2	130.2	160.7	107.8	162.1	217.1	118.1
	1979	131.8	165.2	107.0	128.2	160.0	105.0	160.6	208.6	122.2
	1980	134.4	167.8	109.7	130.7	161.8	107.9	163.9	216.6	122.2
	1981	132.4	160.7	113.0	129.0	154.2	111.5	161.6	212.0	123.1
	1982	134.5	165.9	113.1	132.2	160.7	112.3	157.2	206.5	119.6
	1983	134.3	166.8	112.4	131.5	160.8	111.2	160.4	212.7	120.3
	1984	137.2	169.2	115.0	133.0	161.5	113.1	172.0	230.2	127.7
	1985	137.5	167.9	115.9	133.2	161.2	113.5	171.7	222.7	133.1
	1986	136.4	168.3	113.1	131.1	160.7	109.8	176.6	230.2	135.9
U.S.	1970	129.9	157.4	108.8	127.8	154.3	107.6	148.3	185.3	117.6
	1971	129.3	157.6	108.0	126.9	154.5	106.2	150.7	186.0	121.7
	1972	130.1	159.2	108.2	127.6	155.7	106.8	151.1	190.7	119.1
	1973	129.7	159.2	107.8	126.9	155.3	105.9	154.7	195.1	122.6
	1974	130.7	161.2	108.1	127.9	157.1	106.5	154.7	198.2	120.2
	1975	129.4	160.1	106.9	126.7	155.8	105.6	152.7	198.8	116.2
	1976	130.6	161.7	107.8	127.9	157.3	106.7	153.5	201.0	116.2
	1977	131.0	162.6	108.0	128.0	158.0	106.5	156.0	204.0	118.7
	1978	131.6	163.7	108.3	128.7	159.0	107.0	155.5	204.6	117.7
	1979	130.8	163.4	107.1	127.8	158.7	105.7	155.1	204.2	117.8
	1980	132.8	165.5	109.2	129.6	160.5	107.7	158.2	209.0	120.2
	1981	121.6	163.7	108.5	128.5	158.3	107.2	156.7	209.4	117.5
	1982	132.5	164.8	109.5	129.4	159.4	108.2	157.0	210.1	117.9
	1983	132.6	164.3	109.9	129.4	158.9	108.5	156.8	208.4	118.6
	1984	133.5	164.6	111.1	130.2	159.0	109.9	157.8	209.7	119.4
	1985	133.6	164.5	111.1	130.7	159.2	110.3	155.7	206.5	118.3
	1986[3]	132.5	---	---	---	---	---	---	---	---

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[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates (see Technical Notes).

[3] Provisional Data.

Table 2.16
Deaths Due to Malignant Neoplasms by Site Affected, Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
57	Malignant Neoplasms of Trachea, Bronchus, and Lung	4,554	26.3
63	Malignant Neoplasms of Female Breast	1,546	8.9
48	Malignant Neoplasms of Other and Unspecified Colon	1,542	8.9
78	Malignant Neoplasms of All Other and Unspecified Sites	1,284	7.4
69	Malignant Neoplasms of Prostate	1,001	5.8
54	Malignant Neoplasms of Pancreas	729	4.2
81	Other Malignant Neoplasms of Lymphoid and Histiocytic Tissue	513	3.0
42	Malignant Neoplasms of Stomach	460	2.7
75	Malignant Neoplasms of Brain	456	2.6
67	Malignant Neoplasms of Ovary and Other Uterine Adnexa	453	2.6
72	Malignant Neoplasms of Bladder	398	2.3
41	Malignant Neoplasms of Esophagus	368	2.1
73	Malignant Neoplasms of Kidney and Other and Unspecified Urinary Organs	368	2.1
84	Myeloid Leukemia	299	1.7
82	Multiple Myeloma and Immunoproliferative Neoplasms	285	1.6
49	Malignant Neoplasms of Rectum, Rectosigmoid Junction, and Anus	250	1.4
66	Malignant Neoplasms of Other Parts of Uterus	233	1.3
86	Other and Unspecified Leukemia	183	1.1
83	Lymphoid Leukemia	176	1.0
65	Malignant Neoplasms of Cervix Uteri	159	0.9
70	Malignant Neoplasms of Testis	157	0.9
61	Melanoma of Skin	153	0.9
53	Malignant Neoplasms of Gallbladder and Extrahepatic Bile Ducts	152	0.9
56	Malignant Neoplasms of Larynx	147	0.8
39	Malignant Neoplasms of Pharynx	124	0.7
79	Lymphosarcoma and Reticulosarcoma	118	0.7
52	Malignant Neoplasms of Liver not Specified as Primary or Secondary	109	0.6
50	Malignant Neoplasms of Liver, Primary	107	0.6
60	Malignant Neoplasms of Connective and Other Soft Tissue	97	0.6
47	Malignant Neoplasms of Cecum, Appendix, and Ascending Colon	97	0.6
55	Malignant Neoplasms of Retroperitoneum, Peritoneum, and Other and Ill-Defined Sites within the Digestive Organs and Peritoneum	94	0.5
40	Malignant Neoplasms of Other and Ill-Defined Sites within Lip, Oral Cavity, and Pharynx	94	0.5
38	Malignant Neoplasms of Tongue	91	0.5
80	Hodgkin's Disease	83	0.5
77	Malignant Neoplasms of Thyroid Gland and Other Endocrine Glands and Related Structures	60	0.3
46	Malignant Neoplasms of Sigmoid Colon	59	0.3
58	Malignant Neoplasms of All Other and Ill-Defined Sites within the Respiratory System and Intrathoracic Organs	56	0.3

Table 2.16 - Deaths Due to Malignant Neoplasms by Site Affected, Michigan Residents, 1986 (continued)

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
62	Other Malignant Neoplasms of Skin	46	0.3
68	Malignant Neoplasms of Other and Unspecified Female Genital Organs	42	0.2
59	Malignant Neoplasms of Bone and Articular Cartilage	39	0.2
51	Malignant Neoplasms of Intrahepatic Bile Ducts	32	0.2
43	Malignant Neoplasms of Small Intestine, including Duodenum	28	0.2
44	Malignant Neoplasms of Hepatic and Splenic Flexures and Transverse Colon	17	0.1
76	Malignant Neoplasms of Other and Unspecified Parts of Nervous System	16	0.1
71	Malignant Neoplasms of Penis and Other Male Genital Organs	13	0.1
85	Monocytic Leukemia	12	0.1
64	Malignant Neoplasms of Male Breast	12	0.1
74	Malignant Neoplasms of Eye	7	0.0
45	Malignant Neoplasms of Descending Colon	2	0.0
	Total	17,321	100.0

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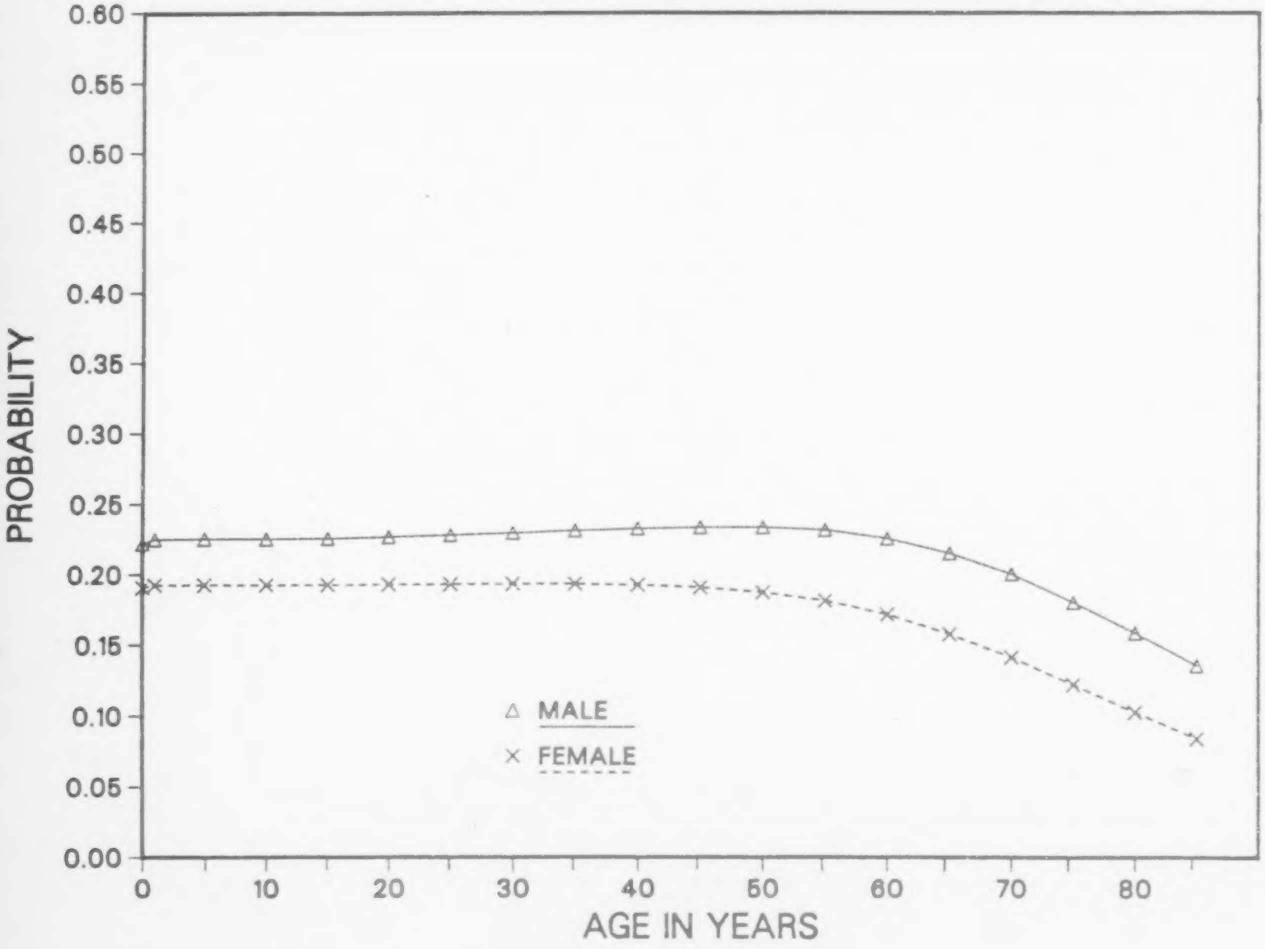
[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.15

PROBABILITY OF EVENTUALLY DYING FROM CANCER BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CEREBROVASCULAR DISEASE

Deaths due to cerebrovascular disease (stroke) numbered 5,421 in 1986 or 6.8 percent of the 80,177 total Michigan resident deaths. This is 107 fewer stroke deaths than were observed in 1985. Of the total in 1986, 60.0 percent were to females.

The median age at death from stroke was 80 years (Table 2.17). The median age for females was 82 years, 6 years higher than that for males. Deaths for white persons due to cerebrovascular disease displayed median ages several years higher than those for black persons and persons of other races. The median age was 68 years for black males, 77 years for white males and 75 years for males of other races. The median was 73 years for black females and 74 years for females of other races. This was 10 years and 9 years less, respectively, than that for white females (83 years).

The cerebrovascular disease death rate was 59.3 in 1986. The rate for females (69.3) was greater than the rate for males (48.7). The age-specific death rates recorded in Table 2.18 and displayed in Figure 2.16 indicate that rates for males and females were similar below age 25 for age groups with sufficient data to calculate rates. Rates for both sexes increased markedly in the older age groups. Rates for males were above those of females from age 25 through 84, but among persons 85 years of age or over, the rate for females was above that for males. The crude death rate for females exceeded that for males because of the larger proportion of women in the high risk older age groups. The age-adjusted rate for males was 16.3 percent higher than the age-adjusted rate for females.

Cerebrovascular disease death rates by age and race from Table 2.18 are graphically displayed in Figures 2.17 and 2.18 for those age and racial groups with sufficient data to calculate rates. Rates for black males and females were higher than comparable rates for white persons in all age groups below age 85 with sufficient events to calculate rates. After 34 years of age, the relative differentials progressively decreased with increasing age. Rates for white persons were considerably higher than those for black persons beyond age 84.

Although the crude rate for white females was 22.5 percent higher than rate for black females, the age-adjusted rate indicates an opposite relationship. The cerebrovascular disease age-adjusted death rate for black females was 68.5 percent higher than that for white females, while for black males the age-adjusted rate was 65.3 percent higher than that for white males.

The historic pattern of cerebrovascular disease death rates has been one of strong variation (Figure 2.19). During the time period 1900-1949, the rates in Michigan ranged from a low of 83.9 in 1902 to a high of 110.0 eight years later. The national high and low rates for the years 1900-1948 were, respectively, 108.6 in 1904 and 84.1 in 1933. Rates for Michigan were below national rates from 1900 through 1907 but were generally, and sometimes markedly, higher from 1908 through 1938. Michigan and national rates were very similar over the next eight years, whereupon the Michigan rate slipped below the national rate and has remained so since.

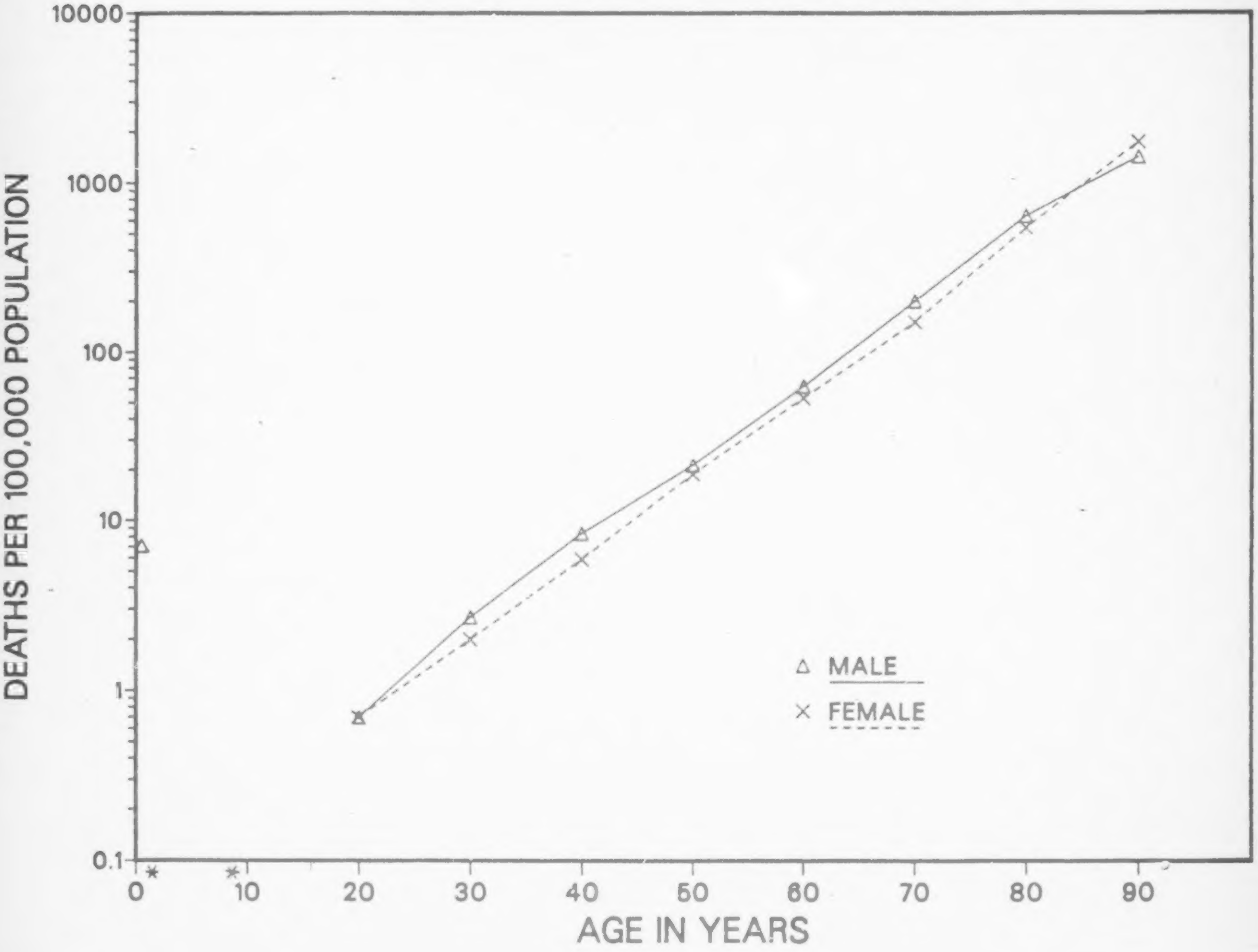
Table 2.17
Deaths Due to Cerebrovascular Disease by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	6	5	1	3	2	1	3	3	-	-	-	-
1-4	1	-	1	1	-	1	-	-	-	-	-	-
5-9	3	2	1	2	1	1	1	1	-	-	-	-
10-14	2	-	2	2	-	2	-	-	-	-	-	-
15-19	3	1	2	3	1	2	-	-	-	-	-	-
20-24	7	4	3	6	3	3	1	1	-	-	-	-
25-29	13	8	5	9	6	3	4	2	2	-	-	-
30-34	24	13	11	16	8	8	7	5	2	1	-	1
35-39	40	23	17	22	15	7	18	8	10	-	-	-
40-44	48	28	20	29	15	14	19	13	6	-	-	-
45-49	72	30	42	50	17	33	22	13	9	-	-	-
50-54	108	63	45	76	46	30	31	16	15	1	1	-
55-59	192	109	83	134	82	52	57	26	31	1	1	-
60-64	288	139	149	227	113	114	59	25	34	2	1	1
65-69	423	216	207	337	174	163	84	42	42	2	-	2
70-74	648	331	317	548	288	260	97	43	54	3	-	3
75-79	829	373	456	713	320	393	110	51	59	6	2	4
80-84	999	387	612	932	360	572	67	27	40	-	-	-
85-89	902	266	636	847	253	594	54	12	42	1	1	-
90+	813	170	643	768	162	606	43	8	35	2	-	2
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	5,421	2,168	3,253	4,725	1,866	2,859	677	296	381	19	6	13
Median Age At Last Birthday	80	76	82	81	77	83	71	68	73	74	75	74

[1] Deaths with race not stated are included only in the total column.

FIGURE 2.16

AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

Table 2.18
Cerebrovascular Disease Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	59.3	48.7	69.3	60.6	48.9	71.8	55.2	51.3	58.6
Under 1 Year	4.3	7.1	*	*	*	*	*	*	*
1-14 Years	0.3	*	*	0.3	*	*	*	*	*
15-24 Years	0.7	0.7	0.7	0.7	*	0.8	*	*	*
25-34 Years	2.4	2.7	2.0	1.9	2.1	1.7	5.2	7.3	*
35-44 Years	7.1	8.4	5.9	4.8	5.7	3.9	24.9	31.6	19.5
45-54 Years	20.2	21.4	18.9	16.1	16.4	15.8	52.8	64.6	43.2
55-64 Years	57.8	62.7	53.4	49.2	55.5	43.4	128.1	122.8	132.7
65-74 Years	173.0	200.8	151.1	159.9	189.5	136.6	290.9	313.5	273.5
75-84 Years	580.5	640.6	544.1	576.9	636.8	541.1	628.7	697.9	583.1
85 Years and Over	1652.3	1429.0	1745.3	1703.5	1503.7	1785.6	1130.9	707.7	1338.9
Age-Adjusted Rate[2]	31.6	34.2	29.4	29.5	32.0	27.3	49.2	52.9	46.0

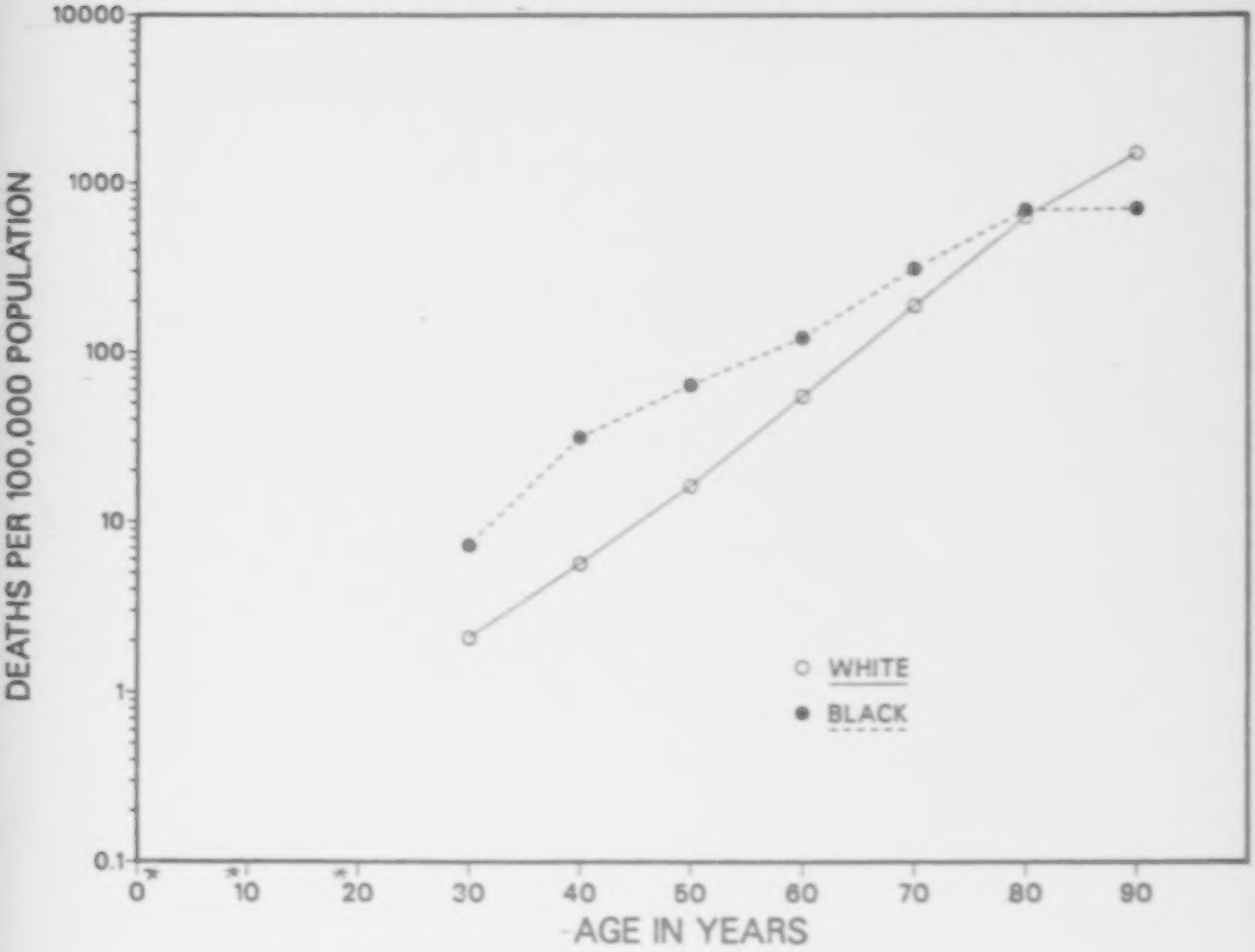
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.17
AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1986



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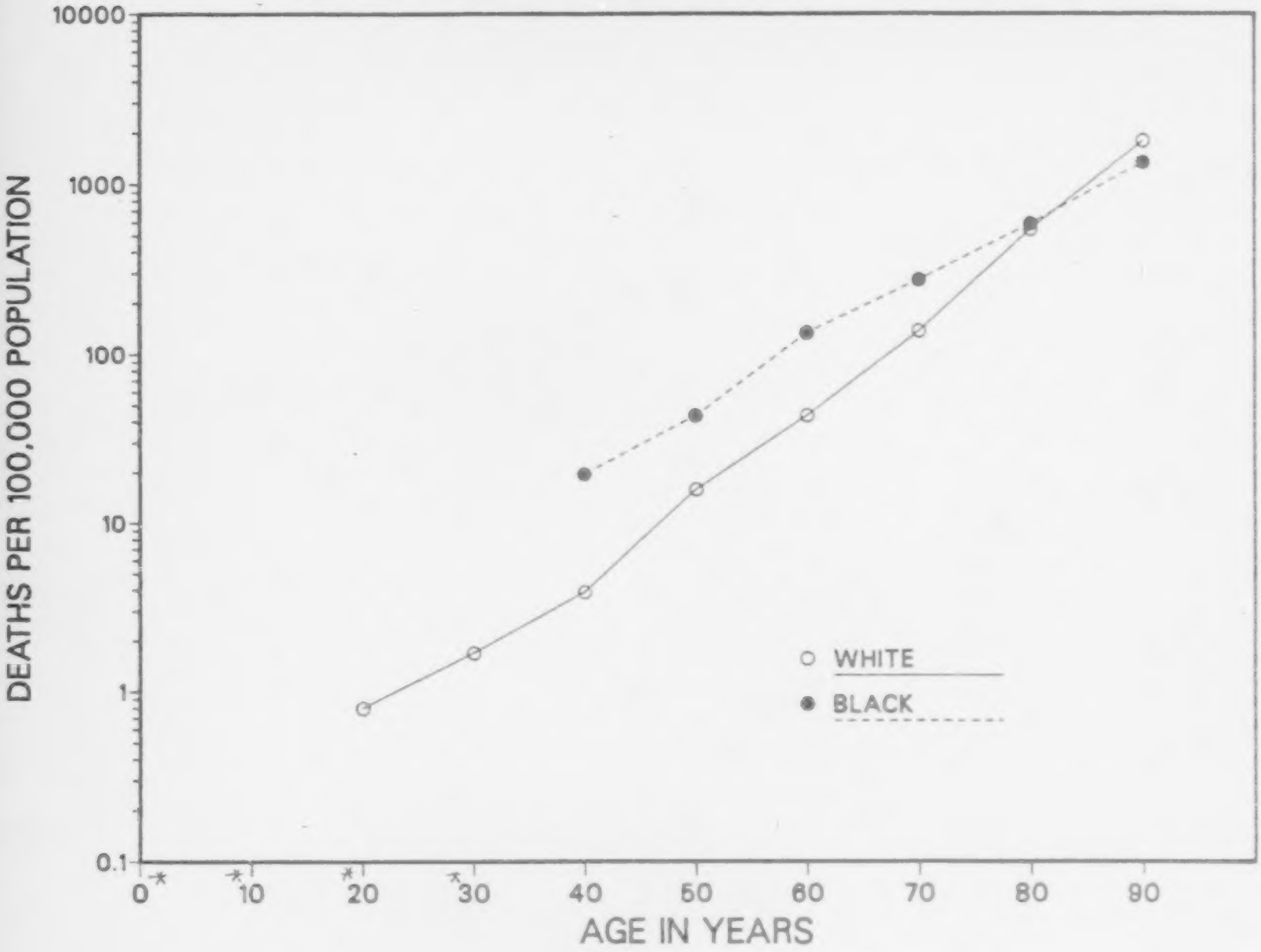
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.18
AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1986



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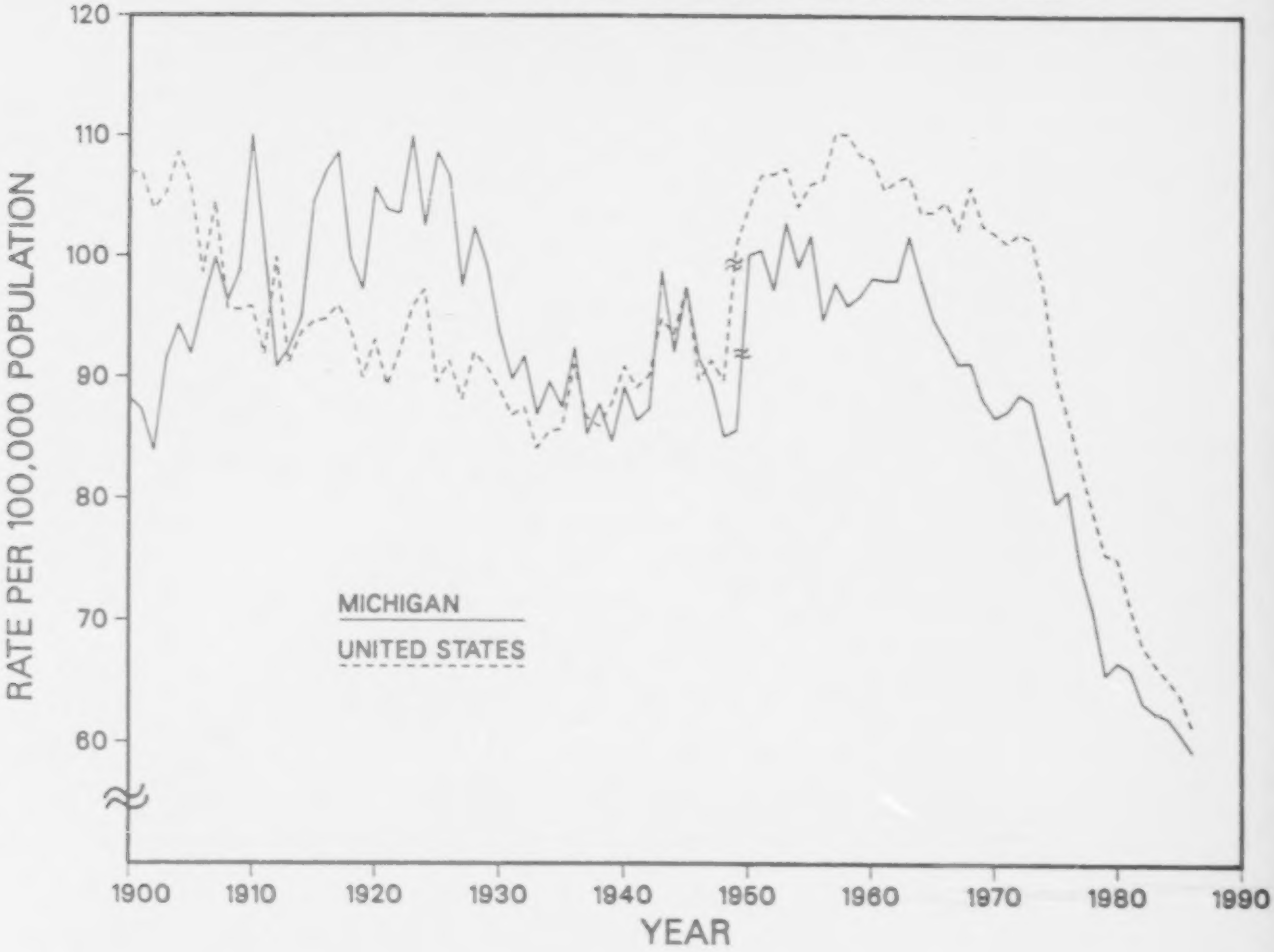
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.19

CEREBROVASCULAR DISEASE DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] The comparability of cerebrovascular disease death rates from the 5th revision of ICDA coding procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be 1.16. The 6th revision was adopted in 1949 for national cause-of-death statistics and in 1950 for Michigan statistics. The comparability of cerebrovascular disease death rates through the 6th, 7th, 8th, and 9th revisions (1949 to date nationally and 1950 to date in Michigan) is high. General comparison before and after these dates can be made but detailed study requires special consideration. See Technical Notes.

The 6th revision to ICD cause of death coding was adopted in the year 1949 nationally and in 1950 in Michigan. This revision resulted in a lack of direct comparability between cerebrovascular disease death rates prior to these dates and those after adoption. Since the significant change in coding procedures, the cerebrovascular disease death rate in Michigan has ranged from a high of 102.8 in 1953 to a low of 59.3 in 1986.

Recent cerebrovascular disease death rates over the last twenty years have shown a clear downward tendency both nationally and in Michigan. The 1986 rate for Michigan was 26.5 percent below the rate of 1976. In 1986 the Michigan rate was 3.3 percent below the United States provisional rate of 61.3.

Age-adjusted rates for cerebrovascular disease deaths by race and sex are presented in Table 2.19. These rates have declined by 51.7 and 51.6 percent since 1970 for white and other than white females, respectively, by 52.9 percent for white males and by 47.3 percent for other than white males. Rates for other than white persons, however, remained substantially above rates for white persons throughout the period.

Age-adjusted rates for the United States showed a similar pattern of decline. However, while Michigan and national rates were quite similar for white males and females, the state age-adjusted rates for other than white males and females were lower than comparable national rates almost each year until 1985 when national rates for other than white females were less than the rates for their Michigan counterparts (see Technical Notes). In 1986, the Michigan age-adjusted rate for cerebrovascular disease deaths was 3.9 percent above the national provisional rate.

Acute but ill-defined cerebrovascular disease was most frequently given as the type of cerebrovascular disease causing death (2,538 deaths). Second in frequency was cerebral thrombosis and unspecified occlusion of cerebral arteries which caused 1,052 deaths in 1986 (Table 2.20). These two cause of death categories comprised 66.2 percent of all stroke deaths. Intracerebral and other intracranial hemorrhage caused 768 deaths while other and late effects of cerebrovascular diseases caused 731 stroke deaths.

Based upon the mortality experience of 1984 through 1986, at birth a Michigan male faces a 0.060 chance of dying from cerebrovascular disease while the probability for a female at birth is 0.097. For both sexes the probability of eventual death due to this cause increases with advancing age. At all ages females are more likely to eventually die from this cause than are males (Figure 2.20). This results primarily from the higher risks from competing causes for males. At ages 60-64, the probabilities for males start a slightly accelerated rise, reaching 0.085 at ages 85 and above. Data for females reveal a similar tendency. The peak probability for females is 0.124 at age 85.

Table 2.19
Age-Adjusted Cerebrovascular Disease Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	64.7	70.8	59.9	61.5	67.9	56.5	93.9	95.4	92.2
	1971	63.7	72.5	56.7	61.0	70.4	53.5	86.9	89.1	84.9
	1972	63.3	69.5	58.2	60.6	66.6	55.6	84.8	91.8	78.2
	1973	61.4	67.4	56.4	58.9	65.0	53.9	80.8	86.2	76.4
	1974	57.8	64.7	52.2	55.5	62.4	50.0	74.6	81.6	68.2
	1975	53.9	60.1	49.0	52.1	57.9	47.6	67.3	77.2	59.0
	1976	53.1	58.0	49.3	51.2	56.2	47.3	67.2	71.9	63.3
	1977	48.4	54.0	44.0	46.4	51.9	42.2	64.2	71.9	58.2
	1978	45.2	49.3	42.0	42.9	47.3	39.6	62.7	63.8	61.1
	1979	40.9	46.3	36.8	38.6	44.0	34.6	58.6	64.3	53.8
	1980	40.6	44.9	37.4	38.1	42.4	35.0	59.4	64.1	55.6
	1981	37.8	41.3	35.6	35.6	39.1	33.3	53.6	57.3	50.5
	1982	34.9	39.9	31.6	33.2	37.9	29.8	48.3	54.8	43.3
	1983	34.1	37.6	31.9	32.0	35.3	29.6	50.0	53.4	47.1
	1984	34.5	37.9	32.1	33.0	36.2	30.6	45.3	50.7	41.3
	1985	33.2	36.5	30.6	31.0	34.4	28.3	49.3	51.8	46.8
	1986	31.6	34.2	29.4	29.5	32.0	27.3	47.3	50.3	44.6
U.S.	1970	66.3	73.2	60.8	61.8	68.8	56.2	107.0	113.5	101.4
	1971	65.0	72.7	59.1	60.9	68.7	54.9	102.0	109.4	95.8
	1972	64.6	72.3	58.6	60.6	68.4	54.5	100.6	107.6	94.8
	1973	63.1	69.9	57.9	59.0	65.8	53.9	98.6	106.4	92.3
	1974	59.2	65.9	54.1	55.7	62.4	50.8	89.7	98.0	83.0
	1975	53.7	60.0	49.0	50.6	56.7	46.1	80.8	88.9	74.2
	1976	50.6	56.1	46.5	47.6	53.0	43.6	76.2	84.1	69.9
	1977	47.3	52.7	43.3	44.4	49.7	40.6	71.7	79.3	65.6
	1978	44.4	49.1	40.8	41.6	46.0	38.4	67.6	76.1	60.9
	1979	41.6	45.9	38.3	38.9	42.9	35.9	63.6	71.8	57.1
	1980	40.8	44.9	37.6	38.0	41.9	35.2	62.9	70.5	57.0
	1981	38.1	41.7	35.4	35.6	38.9	33.1	58.5	65.6	53.2
	1982	35.8	39.2	33.2	33.4	36.6	31.0	54.8	61.8	49.6
	1983	34.4	37.7	31.8	32.0	35.2	29.6	52.6	57.8	48.6
	1984	33.4	36.4	31.1	31.1	33.9	28.9	51.1	56.3	46.9
	1985	32.3	35.2	30.0	30.1	32.8	27.9	49.4	54.2	45.5
	1986[3]	30.4	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1971-1982 have been revised based upon revisions to population estimates. (see Technical Notes)

[3] Provisional Data.

Table 2.20

Deaths Due to Cerebrovascular Diseases by Specific Cause, Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
154	Acute but Ill - Defined Cerebrovascular Disease	2,538	46.8
152	Cerebral Thrombosis and Unspecified Occlusion of Cerebral Arteries	1,052	19.4
150	Intracerebral and Other Intracranial Hemorrhage	768	14.2
155	Other and Late Effects of Cerebrovascular Diseases	731	13.5
149	Subarachnoid Hemorrhage	250	4.6
151	Occlusion and Stenosis of Precerebral Arteries	53	1.0
153	Cerebral Embolism	29	0.5
	Total	5,421	100.0

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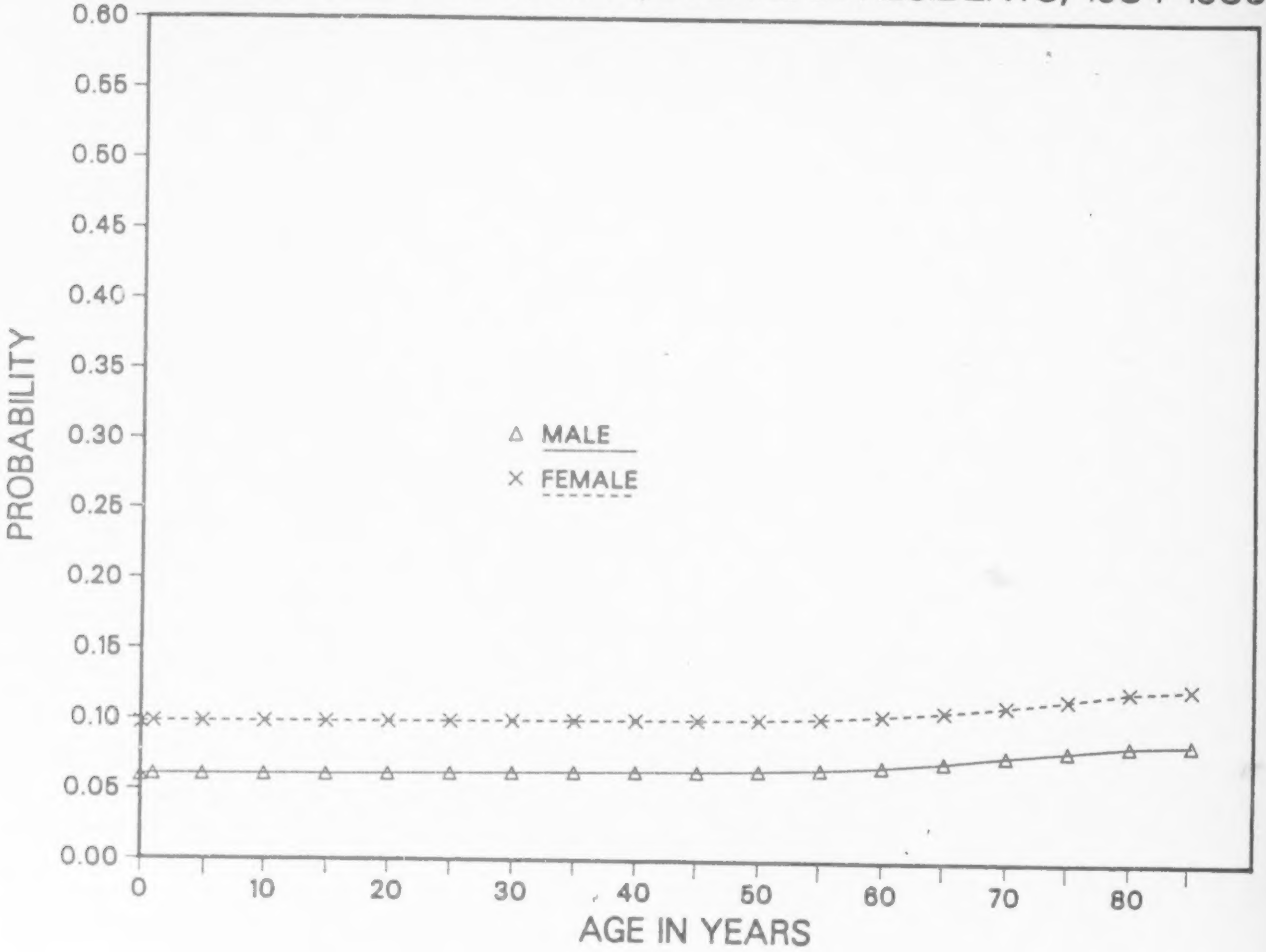
[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.20

PROBABILITY OF EVENTUALLY DYING FROM CEREBROVASCULAR DISEASE BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

ACCIDENTS

Of all Michigan resident deaths in 1986, 4.0 percent were attributed to accidents. The total of 3,202 accidental deaths was 26 less than in 1985. In 1986 67.6 percent of the total accidental deaths were to males.

The median age at death among accident victims was 37 years (Table 2.21). The median age among males was 33, 19 years lower than the 52 year median for females. This differential is predominantly traceable to the age at death distribution of white females. The median age of accidental death for white males was 32 years compared to 36 years for black males and 38 years for males of other races. For white females who died from accidents the median of 56 years was 20 years higher than that for their black counterparts and 18 years higher than that for their counterparts of other races.

Accidental deaths among white males were especially concentrated in the 15-34 year old year age ranges. These four age groups accounted for 45.5 percent of accidental deaths for white males compared to 33.6 percent for black males, 50.0 percent for females of other races and less than 28 percent for all other race-sex categories.

The crude death rate from accidents for males was 2.2 times that for females. Age-specific accident death rates for males were greater than those for females in all age groups. The differentials between rates for males and females were greatest between ages 15 and 44. In the 25-34 year age group, the rate for males was 4.1 times that for females. The differential between the rates for males and females narrowed between ages 45 and 74 and then widened for ages above 74. The age-adjusted death rate for males was 2.6 times that for females (Table 2.22).

Accident mortality rates by sex contained in Table 2.22 are displayed graphically in Figure 2.21. Although age-specific rates for males are generally greater than those for females, the patterns of change are quite similar. Mortality rates for children between 1 and 14 years of age were somewhat less than those for infants under one year. Rates then rose sharply for both sexes in the 15-24 year age group. From this initial peak the rates for both groups declined somewhat, for males, declining through age 54 and, for females, declining through age 44. Beyond those ages, the rates for both sexes increased continuously.

Age-specific accident death rates for white and black persons are graphically displayed in Figures 2.22 and 2.23. Rates for white males were higher than those for black males only in the 15-24 and 85 and above age groups. Both the crude and age-adjusted accident death rates for black males were somewhat higher than those for white males. The rates for black females were higher than those for white females in the 1-14 age group and between 25 and 64 years of age. At 65 years of age and above the rates for white females were higher. Both the crude and age-adjusted rates for white females were greater than the corresponding rates for black females (Table 2.22).

Michigan's accident death rate in 1900 was 71.9. The highest rate observed in this century was 103.1 in 1936. In nine of the last twelve years the accident death rates have fallen or remained the same. The rate of 32.2 in 1983 was the lowest rate of the century. The

Table 2.21
Deaths Due to Accidents by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	24	14	10	20	12	8	3	1	2	-	-	-
1-4	96	56	40	72	42	30	24	14	10	-	-	-
5-9	78	53	25	49	36	13	28	16	12	1	1	-
10-14	100	72	28	85	58	27	14	13	1	1	1	-
15-19	344	253	91	315	232	83	28	21	7	1	-	1
20-24	360	273	87	328	246	82	31	26	5	1	1	-
25-29	276	223	53	241	196	45	32	26	6	3	1	2
30-34	247	195	52	206	165	41	38	28	10	3	2	1
35-39	190	152	38	147	113	34	39	36	3	4	3	1
40-44	146	104	42	116	85	31	27	17	10	3	2	1
45-49	113	75	38	90	60	30	21	13	8	2	2	-
50-54	114	82	32	95	67	28	17	13	4	2	2	-
55-59	111	73	38	90	56	34	21	17	4	-	-	-
60-64	139	94	45	121	83	38	17	10	7	-	-	-
65-69	155	85	70	137	70	67	17	14	3	1	1	-
70-74	162	84	78	148	76	72	13	8	5	1	-	1
75-79	153	90	63	134	75	59	17	14	3	2	1	1
80-84	166	79	87	158	72	86	8	7	1	-	-	-
85-89	128	65	63	122	60	62	6	5	1	-	-	-
90+	99	41	58	93	39	54	6	2	4	-	-	-
Not Stated	1	1	-	1	1	-	-	-	-	-	-	-
All Ages	3,202	2,164	1,038	2,768	1,844	924	407	301	106	25	17	8
Median Age At Last Birthday	37	33	52	37	32	56	36	36	36	38	38	38

[1] Deaths with race not stated are included only in the total column.

Table 2.22
Accident Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	35.0	48.6	22.1	35.5	48.3	23.2	33.2	52.3	16.3
Under 1 Year	17.3	19.8	14.8	18.5	22.3	14.5	*	*	*
1-14 Years	14.2	18.4	9.9	13.1	16.8	9.2	20.6	26.5	14.5
15-24 Years	46.3	68.7	23.5	50.7	74.5	26.3	25.2	41.1	10.0
25-34 Years	33.5	54.1	13.3	33.6	54.2	13.0	33.1	56.4	13.8
35-44 Years	27.2	42.3	12.7	24.6	37.4	12.1	44.4	79.7	15.8
45-54 Years	25.4	36.2	15.2	23.6	33.1	14.5	37.8	57.9	21.6
55-64 Years	30.1	42.2	19.1	28.7	39.5	18.8	43.1	67.4	22.4
65-74 Years	51.2	62.1	42.7	51.5	59.9	44.9	48.2	81.1	22.8
75-84 Years	101.3	142.5	78.4	102.4	137.7	81.3	88.8	187.9	*
85 Years and Over	219.7	350.7	165.1	227.8	362.3	172.6	139.9	247.7	86.9
Age-Adjusted Rate[2]	31.5	45.8	17.9	31.4	45.2	18.2	33.3	54.2	16.0

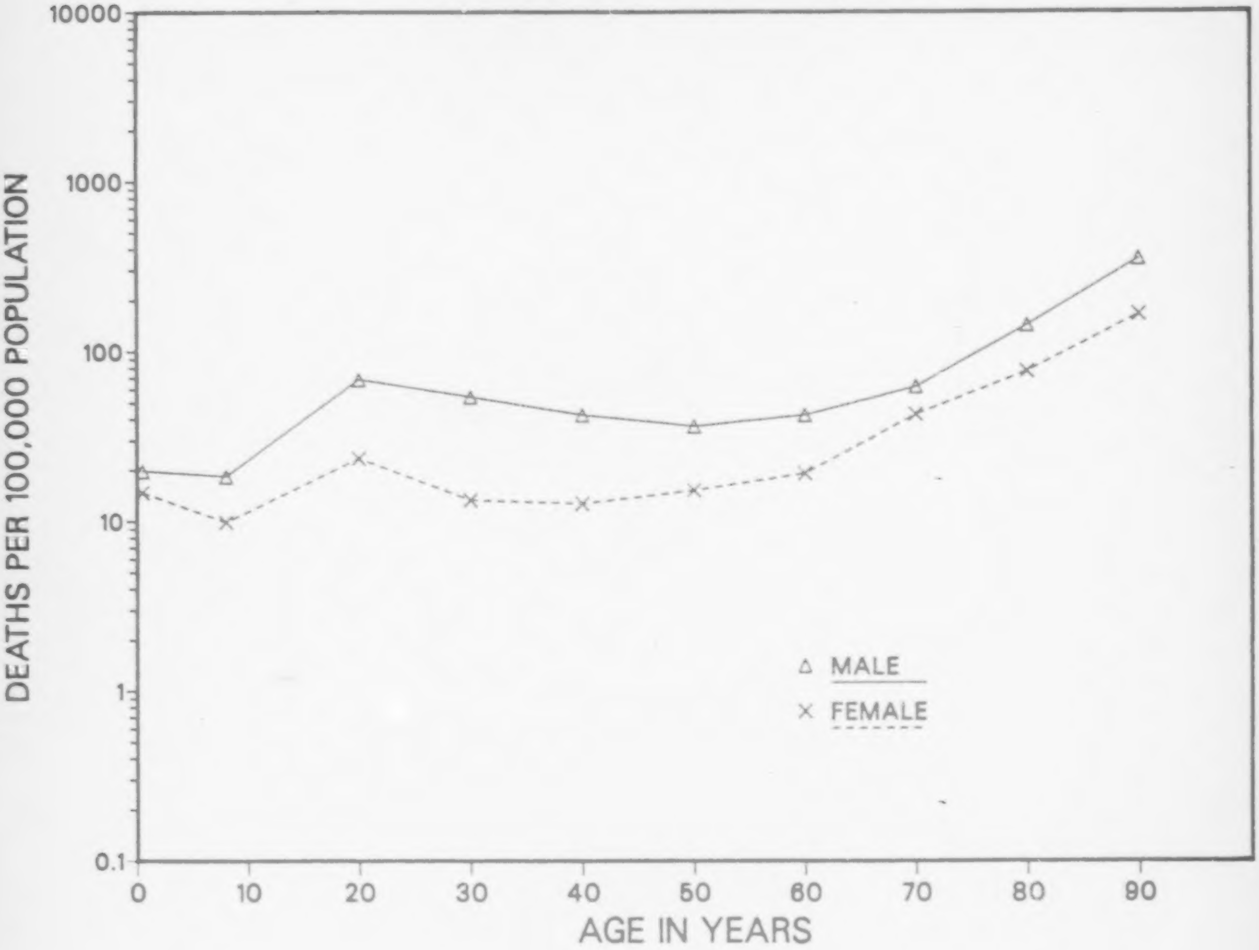
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.21
AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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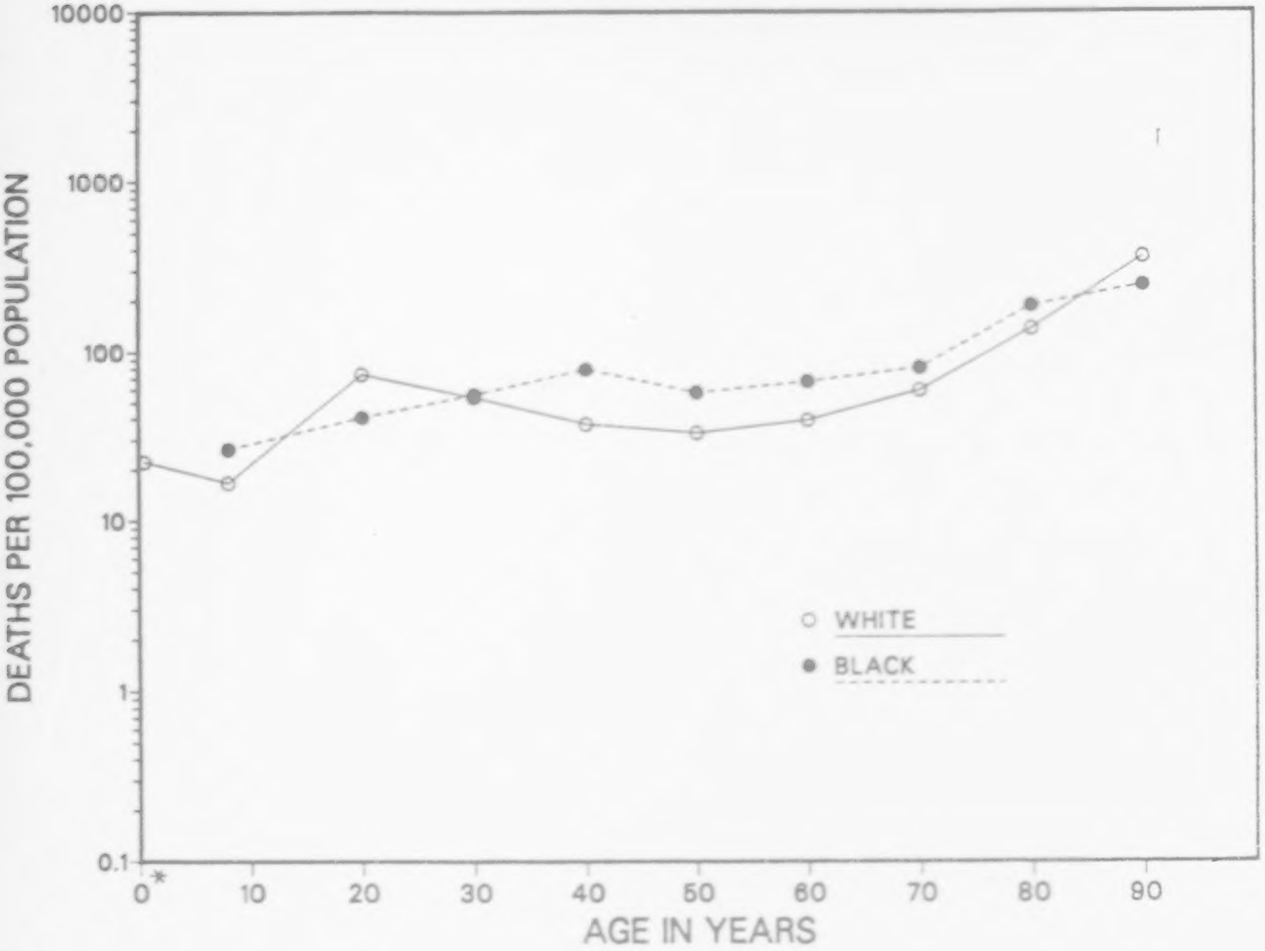
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.22

AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1986



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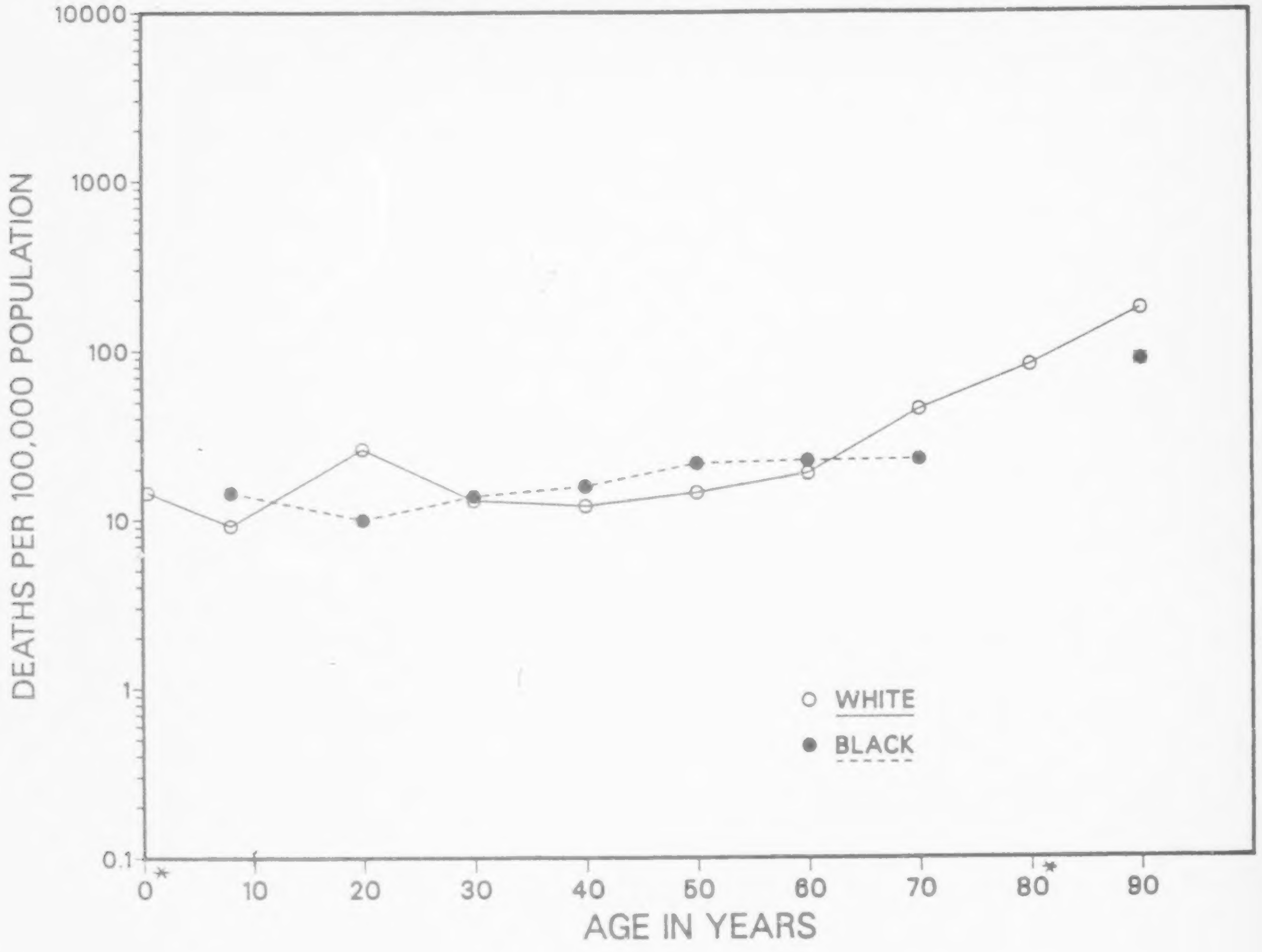
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.23
AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1986



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[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

rate of 35.0 in 1986 was 8.7 percent higher than that of 1983 and was slightly less than the 1985 rate of 35.5.

The highest national accident death rate was 101.8 in 1907. The lowest national rate of the century was the rate of 38.6 for 1985. Michigan's rates have been below national rates fairly consistently since 1900. The last time Michigan's rate was above that of the United States was in 1964. The accident death rate for Michigan in 1986 was 11.8 percent below the provisional rate of 39.7 for the nation (Figure 2.24).

Michigan's age-adjusted death rates for accidental deaths have also been below the comparable national rates since 1970 (Table 2.23). Between 1970 and 1983 Michigan's age-adjusted rate declined by 38.3 percent. The Michigan rates then rose 7.0 percent between 1983 and 1985. In 1986 the Michigan rate was 1.9 percent below the 1985 rate. Between 1970 and 1986 the national age-adjusted rate declined by 33.9 percent (see Technical Notes). Michigan's rate was 11.3 percent below the national provisional rate in 1986.

The age-adjusted rates by race and sex declined for each population subgroup between 1970 and 1986. Other than white female rates have been generally below, but about the same as those for white females since 1970, fluctuating from about 14.6 percent above to 20.3 percent below the white female rates. For males, other than white male rates have fluctuated from 3.0 percent below to 24.4 percent above the white male rate between 1970 and 1986. Generally the rates for other than white males have been higher than those for white males.

Nationally, the differential between other than white males and white males moved from 51.8 percent above in 1970 to 23.2 percent above in 1985, the last year for which such data were available. The rates for other than white females were 29.0 percent higher in 1970 and 10.9 percent higher in 1985 than the white female rates.

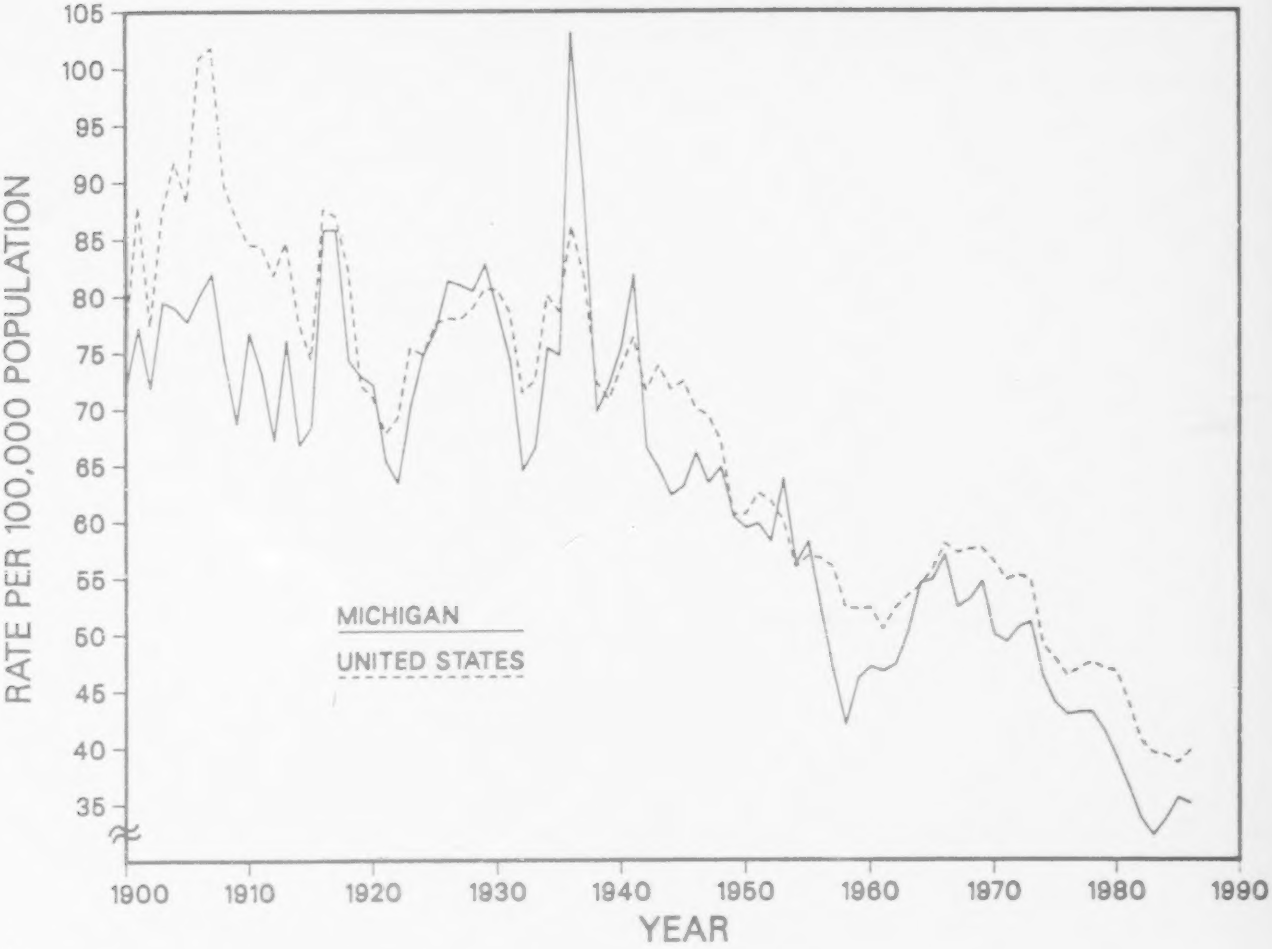
Motor vehicle accidents involving collision with another motor vehicle was the largest single cause of accidental death in 1986, resulting in 762 deaths (Table 2.24). Deaths from all types of motor vehicle accidents accounted for 1,736 deaths in 1986. Accidental falls of all types resulted in 403 deaths. Accidents caused by fires and flames, accidental poisonings, and accidental drownings caused 180, 156, and 120 deaths, respectively. Choking on food or other objects was the cause of 104 deaths. Medical misadventures, water transport accidents and air and space transport accidents each accounted for 78, 51 and 41 deaths in 1986, respectively. Accidents caused by handguns and other firearms resulted in the deaths of 30 Michigan residents. (Table 2.24).

Deaths from motor vehicle accidents accounted for 54.2 percent of all accidental deaths in 1986. After age 14, the proportion of motor vehicle accident deaths decreased by age group, from 78.6 percent for persons 15-24 years of age to a low of 30.6 percent of accident deaths for persons 65 years of age or over (Table 2.25).

Among children under 15 years the most frequent causes of accidental death were motor vehicle accidents, fire and drownings, resulting in 135, 52, and 44 deaths respectively in

FIGURE 2.24

ACCIDENT DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-198 . United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] Accidental death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.23
Age-Adjusted Accident Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	48.6	71.3	27.4	47.5	69.6	26.8	56.1	83.9	30.7
	1971	47.7	69.9	26.8	46.7	68.1	26.5	55.0	84.7	28.2
	1972	48.7	72.9	25.9	48.3	72.1	25.8	51.6	80.1	25.7
	1973	48.9	72.4	26.6	48.0	71.0	26.1	54.4	82.7	28.8
	1974	43.8	65.5	23.2	43.3	64.2	23.3	47.3	75.5	22.0
	1975	41.5	61.7	22.4	41.2	61.1	22.2	44.1	67.2	23.8
	1976	40.0	58.7	22.4	40.0	58.5	22.6	39.6	61.0	20.8
	1977	40.4	59.1	22.8	40.3	58.7	22.7	41.2	62.7	22.2
	1978	40.3	59.5	22.2	40.2	59.4	21.9	42.0	63.0	24.0
	1979	38.4	56.2	21.8	38.4	55.7	21.9	39.6	61.7	20.5
	1980	36.4	53.3	20.6	36.3	52.2	21.2	37.9	62.4	16.9
	1981	34.6	52.4	18.2	35.4	53.0	18.5	32.6	51.4	16.7
	1982	32.1	47.4	17.8	32.3	47.4	17.8	32.2	49.3	17.8
	1983	30.0	45.5	15.6	30.5	46.1	15.5	29.4	44.5	16.8
	1984	30.3	44.9	16.6	30.1	44.2	16.7	32.0	50.5	16.3
	1985	32.1	47.2	17.8	31.7	46.1	17.9	34.4	55.6	16.4
	1986	31.5	45.8	17.9	31.4	45.2	18.2	32.4	52.4	15.8
U.S.	1970	53.7	80.7	28.2	51.0	76.2	27.2	72.8	115.7	35.1
	1971	51.7	77.0	27.9	49.2	72.9	26.8	70.1	109.8	35.3
	1972	51.7	77.1	27.9	49.5	73.1	27.0	68.4	108.6	33.2
	1973	51.3	76.8	27.2	49.2	73.1	26.2	66.9	105.9	32.9
	1974	45.5	68.8	23.5	43.9	66.0	22.7	57.8	91.3	28.6
	1975	44.2	67.0	22.8	42.6	64.1	22.1	56.1	89.5	27.1
	1976	42.5	63.9	22.4	41.3	61.5	21.9	52.3	83.4	25.3
	1977	43.1	64.5	22.8	41.9	62.2	22.4	52.1	83.1	25.2
	1978	43.5	65.4	22.9	42.5	63.4	22.4	51.5	81.7	25.6
	1979	42.9	64.9	21.9	42.0	63.3	21.6	49.3	78.9	23.9
	1980	42.3	64.0	21.8	41.5	62.3	21.4	49.5	78.4	24.8
	1981	39.8	60.2	20.4	39.3	59.1	20.2	44.0	70.4	21.4
	1982	36.6	55.2	18.9	36.1	54.1	18.7	40.8	64.5	20.5
	1983	35.3	52.9	18.7	34.7	51.8	18.3	40.2	62.5	21.0
	1984	35.0	52.3	18.7	34.6	51.3	18.5	38.5	60.5	19.5
	1985	34.7	51.8	18.6	34.1	50.4	18.4	39.7	62.1	20.4
	1986[3]	35.5	---	---	---	---	---	---	---	---

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[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes)

[3] Provional Data.

Table 2.24
Deaths Due to Accidents by Type of Accident, Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
236	Motor Vehicle Accidents Involving Collision with Another Motor Vehicle	762	23.8
239	Motor Vehicle Accidents Not Involving Collision on Highway	366	11.4
252	Fracture, Cause Unspecified, and Other and Unspecified Falls	282	8.8
237	Motor Vehicle Accidents Involving Collision with Pedestrian	243	7.6
262	All Other Accidents, and Late Effects of Accidental Injury	236	7.4
238	Motor Vehicle Accidents Involving Collision with Other Vehicle or Object	220	6.9
253	Accidents Caused by Fires and Flames	180	5.6
255	Accidental Drowning and Submersion	120	3.7
250	Fall From One Level to Another	116	3.6
256	Inhalation and Ingestion of Food or Other Object Causing Obstruction of Respiratory Tract or Suffocation	104	3.2
246	Accidental Poisoning by Drugs, Medicaments, and Biologicals	91	2.8
249	Misadventures During Medical Care, Abnormal Reactions, and Late Complications	78	2.4
240	Motor Vehicle Traffic Accidents of Unspecified Nature	73	2.3
248	Accidental Poisoning by Gases and Vapors	59	1.8
243	Water Transport Accidents	51	1.6
241	Motor Vehicle Nontraffic Accidents	46	1.4
244	Air and Space Transport Accidents	41	1.3
258	Accidents Caused by All Other and Unspecified Firearms	27	0.8
261	Accidents Caused by Electric Current	27	0.8
235	Motor Vehicle Accidents Involving Collision with Train	26	0.8
259	Accidents Caused by Explosive Material	9	0.3
260	Accidents Caused by Hot Substance or Object, Caustic or Corrosive Material, Steam, and Exposure to Radiation	8	0.2
263	Drugs, Medicaments, and Biological Substances Causing Adverse Effects in Therapeutic Use	8	0.2
247	Accidental Poisoning by Other Solid or Liquid Substances	6	0.2
234	Railway Accidents	6	0.2
251	Fall on Same Level	5	0.2
242	Other Road Vehicle Accidents	5	0.2
257	Accidents Caused by Handguns	3	0.1
254	Lightning	2	0.1
245	Vehicle Accidents Not Elsewhere Classifiable	2	0.1
	Total	3,202	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the *International Classification of Diseases*, WHO.

Table 2.25

Deaths Due to Accidents by Age at Death and Type of Accident, Michigan Residents, 1986

TYPE OF ACCIDENT	AGE AT DEATH IN YEARS					
	TOTAL	<15	15 - 24	25 - 44	45 - 64	65+
Total	3,202	298	704	859	477	863
Motor Vehicle Accidents	1,736	135	553	545	238	264
Accidental Falls	403	8	13	34	56	292
Accidents Caused by Fire and Flames	180	52	20	40	20	48
Accidental Drownings	120	44	27	29	9	11
Accidental Poisonings	156	6	29	62	30	29
Choking on Food or Other Object	104	11	1	12	19	61
Accidents Caused by Handguns and Other Firearms	30	10	9	6	4	1
Air and Space Transport Accidents	41	-	7	13	19	2
Misadventures During Medical Care, Abnormal Reactions, and Late Complications	78	3	2	7	18	48
Water Transport Accidents	51	-	14	23	8	6
All Other Accidents	303	29	29	88	56	101

1986. Motor vehicle accidents were the leading causes of accidental death among persons 15 through 64 years of age. The next most frequent causes were accidental poisonings for persons 15-24 and 25-44 years of age and accidental falls for persons 45-64 years of age. Accidental falls, which caused 12.6 percent of all accidental deaths, were the leading cause of the accidental deaths (33.8 percent) among persons 65 years of age or older.

Table 2.26 displays the distribution of motor vehicle accident deaths by the age of the deceased person and the type of involvement of the deceased in the accident. Of the 1,736 persons killed in motor vehicle accidents in

Table 2.26
Deaths From Motor Vehicle Accidents by Person Injured and Age at Death, Michigan Residents, 1986

PERSON INJURED	AGE AT DEATH IN YEARS					
	TOTAL	<15	15 - 24	25 - 44	45 - 64	65+
Total	1,736	135	553	545	238	264
Driver of Motor Vehicle Other Than Motorcycle	765	5	229	286	133	112
Passenger in Motor Vehicle Other Than Motorcycle	384	40	161	75	36	72
Motorcyclist	99	4	30	60	3	2
Passenger on Motorcycle	11	1	6	4	-	-
Pedal Cyclist	45	21	12	6	2	4
Pedestrian	262	54	53	61	38	55
Other Unspecified Person	9	4	4	-	1	-
Unspecified Person	161	6	58	53	25	19

1986, 765 (44.1 percent) were driving motor vehicles other than motorcycles at the time of the fatal accident. There were 384 deaths of passengers in motor vehicles other than motorcycles, while 262 pedestrians were killed in motor vehicle accidents. Motorcycle accidents resulted in the deaths of 99 motorcyclists and 11 motorcycle passengers. It should be noted that for 170 deaths (9.8 percent of the total) the type of involvement of the deceased in the accident was not stated.

The type of involvement of the deceased in the accident varied by age. The majority of children under age 15 killed in motor vehicle accidents were either pedestrians (40.0 percent) or passengers (29.6 percent). Well over two-thirds of the persons 15-24 years of age who died in motor vehicle accidents in 1986 were either drivers (41.4 percent) or passengers (29.1 percent) of motor vehicles other than motorcycles. Among persons 25-44 years and 45-64 years of age 52.5 percent and

55.9 percent, respectively, were driving motor vehicles other than motorcycles at the time of the accident. Pedestrians accounted for 20.8 percent of all motor vehicle accident deaths among persons 65 years of age and over, compared to 15.1 percent for persons of all ages.

Of the total 3,202 accidental deaths, 1,718 or 53.7 percent of the accidents occurred on streets and highways (Table 2.27). The second most common place of occurrence was the home with 621 deaths (19.4 percent). There were 54 deaths attributed to accidents at industrial places and premises, 41 in public buildings, and 32 on farms. Note that the place of injury was not specified for 13.5 percent of the accidental deaths.

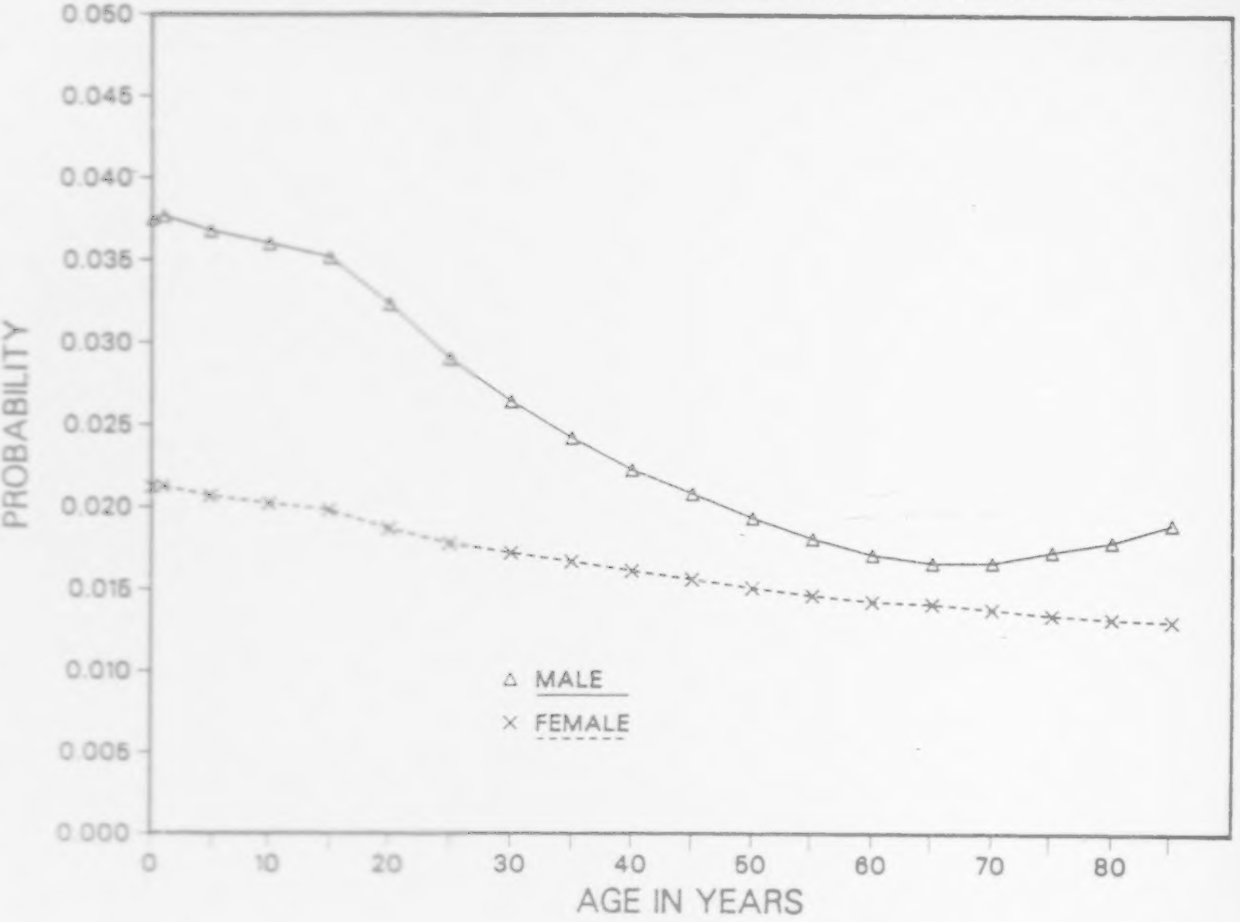
It can be seen from Figure 2.25 that the probability of eventually having an accidental death is greater for younger persons. According to Michigan mortality data from the years 1984 through 1986 the probability of eventually dying from accidental causes is 0.037 for males and 0.021 for females at birth. Probabilities for males decline slowly through childhood and the teenage years, fall rapidly between ages 15 and 54, and thereafter decline

Table 2.27
Deaths Due to Accidents by Place of Injury,
Michigan Residents, 1986

PLACE	NUMBER OF DEATHS
Street and Highway	1,718
Home	621
Place for Recreation and Sport	93
Industrial Place and Premises	54
Resident Institution	50
Public Building	41
Farm	32
Mine and Quarry	5
Other Specified Places	157
Place Not Specified	431
Total	3,202

FIGURE 2.25

PROBABILITY OF EVENTUALLY DYING FROM ACCIDENTAL CAUSES BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

more slowly until the lowest probability of 0.017 is reached at age 65-69. For females the probabilities decline more moderately and steadily. Probabilities for males remain much higher than for females until about age 50 and slightly higher after that age.

CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS

The fifth leading cause of death in 1986 was chronic obstructive pulmonary diseases and allied conditions. This group of diseases caused 2,870 Michigan resident deaths. Of these deaths, 1,791 (62.4 percent) were to males (Table 2.28).

The median age at death of persons who died from these respiratory diseases was 74 years. The median age of females who died from chronic obstructive pulmonary diseases and allied conditions was one year lower than that for males (73 years compared to 74 years). The median age for white persons (74 years) was five years higher than that for black persons (69 years) and two years lower than the median age for persons of other races (76 years).

The crude death rate for chronic obstructive pulmonary diseases and allied conditions was 31.4 per 100,000 population. The crude death rate for males was 1.7 times that for females (Table 2.29). Age-specific rates for males and females from Table 2.29 are graphically presented in Figure 2.26. The strong association between chronic obstructive pulmonary diseases and allied conditions and increasing age is clearly evident.

The age-specific rates for males were greater than those for females in all age groups for which rates can be calculated. The relative differential between rates for males and females increased steadily with age. In the age group 85 years and over the rate for males was 3.9 times that for females. The age-adjusted death rate for this group of diseases was 2.2 times as high for males as it was for females.

Age-specific rates for white and black persons are displayed in Figure 2.27. Rates were higher for black persons through age 54, after which they were higher for white persons. The age-adjusted death rate for these respiratory diseases for white persons was 15.2 percent above that for black persons (Table 2.29).

Table 2.30 presents Michigan age-adjusted death rates by sex and race for the period 1970-1986 for deaths from this group of respiratory diseases. The age-adjusted death rates for males rose 15.7 percent over the period, while for females the rate in 1986 was 2.4 times higher than in 1970. The increase in age-adjusted rates for females was higher for white females (2.5 times) than for other than white females (1.5 times) between 1970 and 1986. The age-adjusted death rate for the total population of Michigan from chronic obstructive pulmonary diseases and allied conditions was 5.4 percent greater than the United States provisional rate in 1986 (see Technical Notes).

Of the 2,870 Michigan resident deaths due to chronic obstructive pulmonary diseases and allied conditions, 1,872 (65.2 percent) were classified as chronic airways obstruction, not elsewhere classified. There were 701 deaths in 1986 due to emphysema, 130 due to asthma, and 148 due to bronchitis (Table 2.31).

Based on mortality data from 1984-1986, the probability of eventual death due to chronic obstructive pulmonary diseases and allied conditions is 0.045 for males and 0.025 for females at birth. The probability for males increases steadily to a peak of 0.054 at ages 70-74 and then declines in the last few age groups

Table 2.28
Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	1	-	1	-	-	-	1	-	1	-	-	-
1-4	2	1	1	1	-	1	1	1	-	-	-	-
5-9	1	1	-	-	-	-	1	1	-	-	-	-
10-14	5	2	3	2	-	2	3	2	1	-	-	-
15-19	3	1	2	1	-	1	2	1	1	-	-	-
20-24	6	1	5	4	-	4	2	1	1	-	-	-
25-29	5	3	2	1	1	-	4	2	2	-	-	-
30-34	4	-	4	2	-	2	2	-	2	-	-	-
35-39	10	6	4	6	4	2	4	2	2	-	-	-
40-44	17	8	9	10	4	6	7	4	3	-	-	-
45-49	24	16	8	19	12	7	5	4	1	-	-	-
50-54	60	33	27	47	23	24	12	9	3	1	1	-
55-59	143	81	62	122	66	56	20	15	5	1	-	1
60-64	252	157	95	231	141	90	21	16	5	-	-	-
65-69	437	266	171	405	246	159	30	19	11	2	1	1
70-74	548	350	198	504	326	178	40	23	17	3	1	2
75-79	532	345	187	502	323	179	27	21	6	3	1	2
80-84	420	272	148	396	254	142	23	17	6	1	1	-
85-89	286	189	97	267	175	92	17	12	5	2	2	-
90+	114	59	55	107	55	52	5	3	2	2	1	1
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	2,870	1,791	1,079	2,627	1,630	997	227	153	74	15	8	7
Median Age At Last Birthday	74	74	73	74	74	74	69	69	69	76	80	74

[1] Deaths with race not stated are included only in the mtotal column.

Table 2.29

Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	31.4	40.2	23.0	33.7	42.7	25.1	18.5	26.5	11.4
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	0.4	*	*	*	*	*	1.6	*	*
15-24 Years	0.6	*	0.9	0.4	*	0.8	*	*	*
25-34 Years	0.6	*	0.8	*	*	*	2.8	*	*
35-44 Years	2.2	2.3	2.1	1.5	1.5	1.5	7.4	9.0	6.1
45-54 Years	9.4	11.3	7.6	8.4	9.1	7.8	16.9	29.0	*
55-64 Years	47.6	60.2	36.1	48.1	58.9	38.2	45.3	74.6	20.4
65-74 Years	159.1	226.2	106.4	164.4	234.7	109.1	112.5	154.9	79.8
75-84 Years	302.3	520.1	170.7	314.9	540.4	180.0	177.6	340.0	70.7
85 Years and Over	385.4	812.8	207.4	394.5	833.4	214.3	256.5	530.8	121.7
Age-Adjusted Rate[2]	19.5	28.8	13.2	19.7	29.0	13.4	17.1	26.7	9.9

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

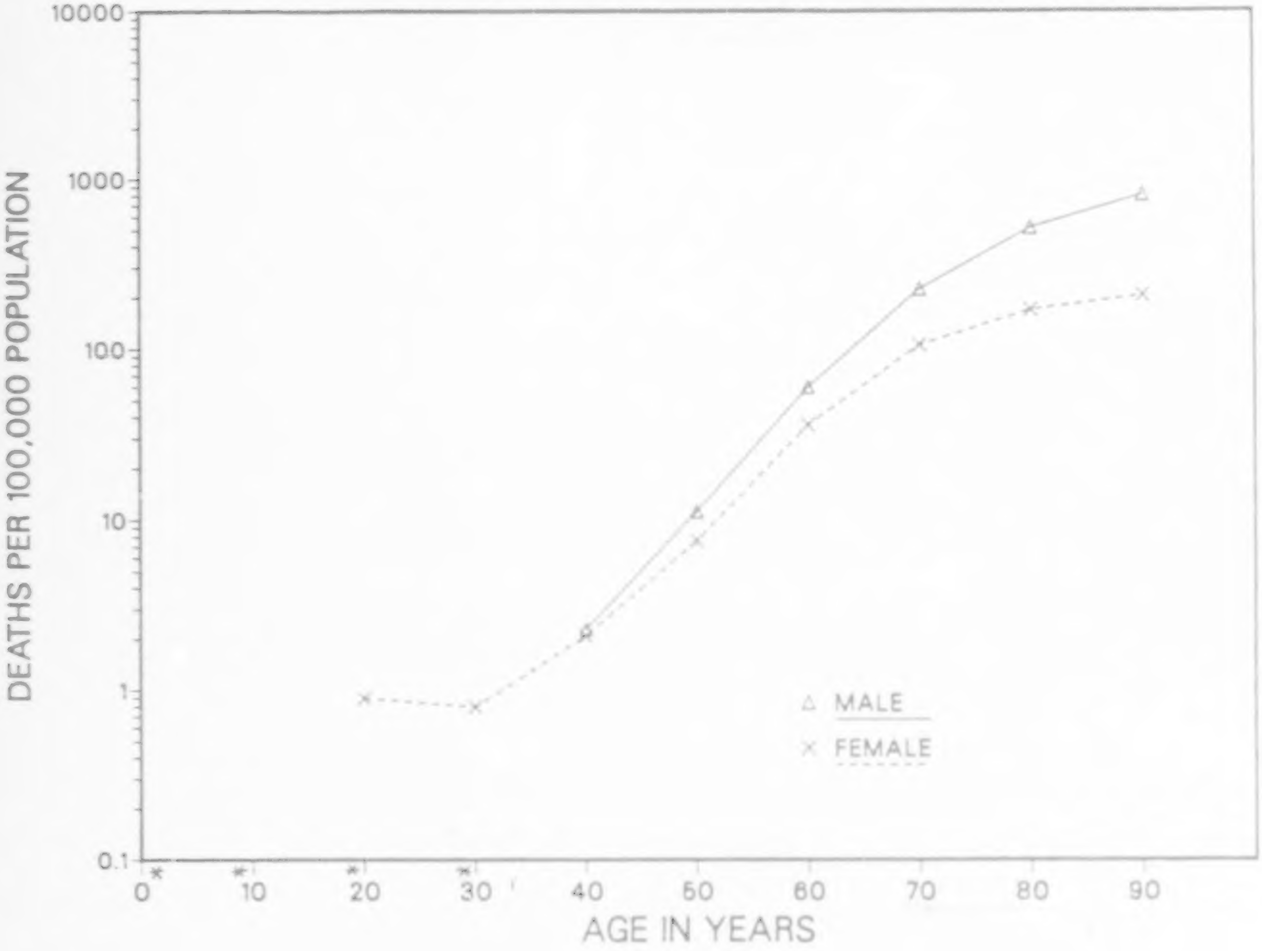
[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.26

AGE-SPECIFIC DEATH RATES FOR DEATHS DUE TO CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY SEX, MICHIGAN RESIDENTS, 1986[1]



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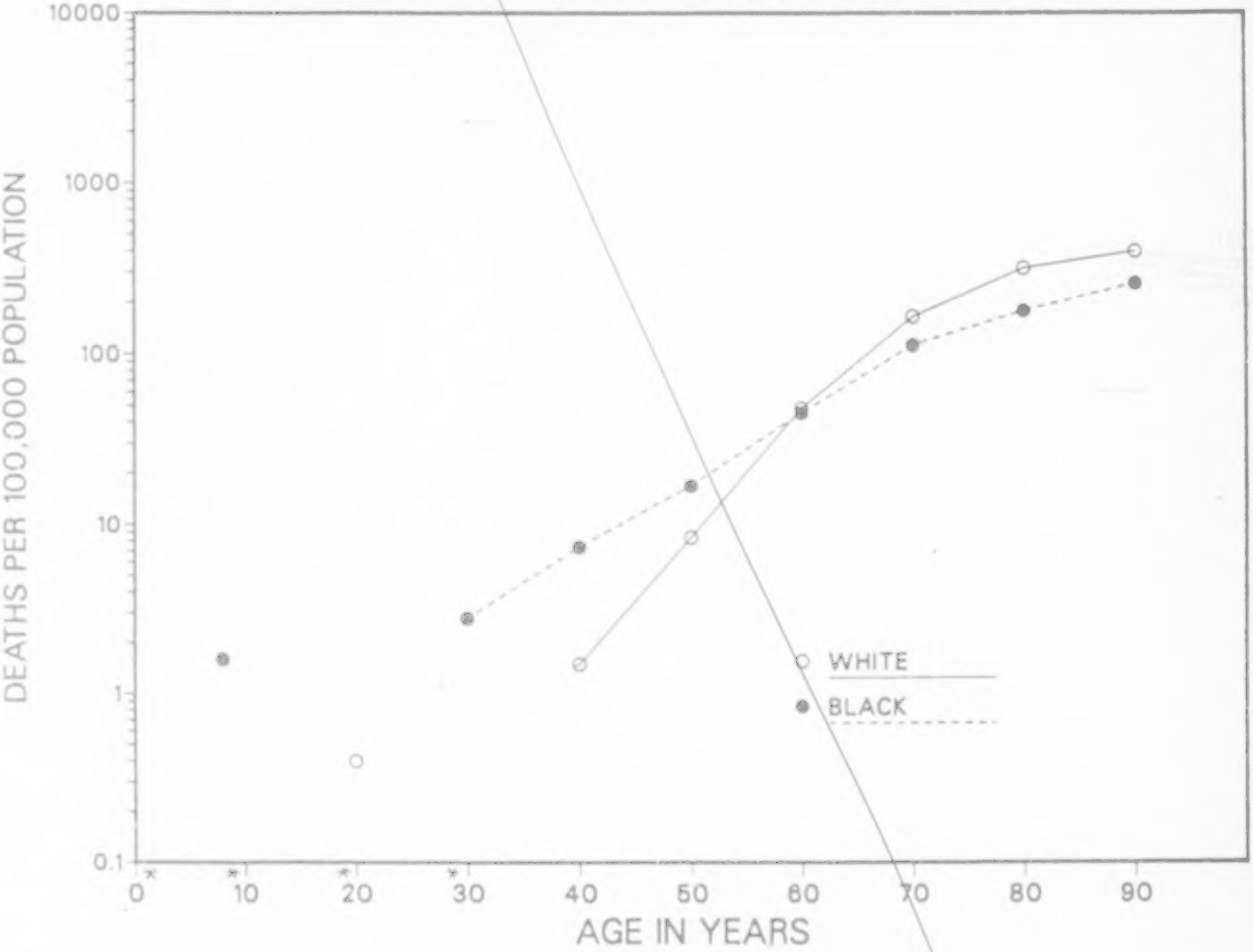
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.27
AGE-SPECIFIC DEATH RATES FOR DEATHS DUE TO CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY RACE, MICHIGAN RESIDENTS, 1986 [1]



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

Table 2.30

Age-Adjusted Death Rates[1] for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions[2] by Race and Sex, Michigan[3] Residents, 1970-1986 and United States Residents, 1979-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	14.2	24.9	5.6	14.3	25.3	5.4	12.3	18.5	6.7
	1971	13.9	24.4	5.6	13.8	24.5	5.4	13.9	22.2	6.5
	1972	14.9	26.5	5.7	15.2	27.2	5.8	11.1	19.3	4.2
	1973	15.4	26.7	6.4	15.6	27.3	6.5	12.2	20.5	5.1
	1974	13.8	24.1	5.8	14.1	24.7	6.0	9.6	17.2	3.1
	1975	14.3	25.1	6.1	14.5	25.6	6.2	11.4	19.0	5.1
	1976	14.7	25.4	6.8	15.0	25.9	6.9	12.0	20.8	5.1
	1977	14.1	24.4	6.5	14.4	25.1	6.5	10.8	17.1	5.9
	1978	15.7	26.1	8.2	15.8	26.3	8.4	13.9	23.7	6.3
	1979	15.2	26.1	7.4	15.5	26.6	7.5	12.7	21.6	5.8
	1980	15.7	25.5	8.9	15.9	25.7	9.1	13.2	22.4	6.0
	1981	15.6	25.5	9.0	15.9	26.0	9.2	12.8	20.7	7.1
	1982	15.5	24.5	9.5	15.7	24.7	9.6	13.7	21.9	7.6
	1983	17.0	25.8	11.5	17.3	25.9	11.8	15.3	24.3	8.7
	1984	17.6	27.4	10.9	17.9	27.8	11.1	14.7	23.4	8.3
	1985	19.3	29.2	12.6	19.4	29.3	12.7	17.9	27.6	11.0
	1986	19.5	28.8	13.2	19.7	29.0	13.4	16.9	26.2	10.0
U.S.	1979	14.6	24.3	7.7	14.9	25.0	8.0	10.5	17.4	5.3
	1980	15.9	26.1	8.9	16.3	26.7	9.2	11.5	19.2	5.8
	1981	16.3	26.2	9.5	16.7	26.8	9.8	11.7	19.6	5.9
	1982	16.2	25.5	9.8	16.6	26.2	10.0	11.7	18.7	6.7
	1983	17.4	27.0	10.9	17.9	27.6	11.3	12.7	20.5	7.1
	1984	17.7	27.0	11.4	18.2	27.6	11.8	13.1	21.0	7.5
	1985	18.7	27.9	12.5	19.2	28.5	12.9	13.8	21.7	8.1
	1986*	18.5	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Categories used for 1970-1978 are 8th Revision ICDA codes 490-493 (bronchitis, emphysema, and asthma) and *519.3 (chronic obstructive lung disease without mention of asthma, bronchitis or emphysema). For years since 1979 9th Revision ICD codes 490-496 are used. No single comparability ratio was developed for the 9th Revision category and the most nearly comparable 8th Revision categories. However, for the combined categories of bronchitis, emphysema, and asthma the provisional comparability ratio is 1.0002, and that for the remaining titles (chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema under the 8th Revision and other chronic obstructive pulmonary diseases and allied conditions under the 9th Revision) is 1.0054. Thus, the comparability between the composite categories is quite good. The composite category was not used for ranking causes of death under the 8th Revision and thus appeared in 1979 for the first time among the 10 leading causes of death.

[3] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates (see Technical Notes).

* Provisional Data.

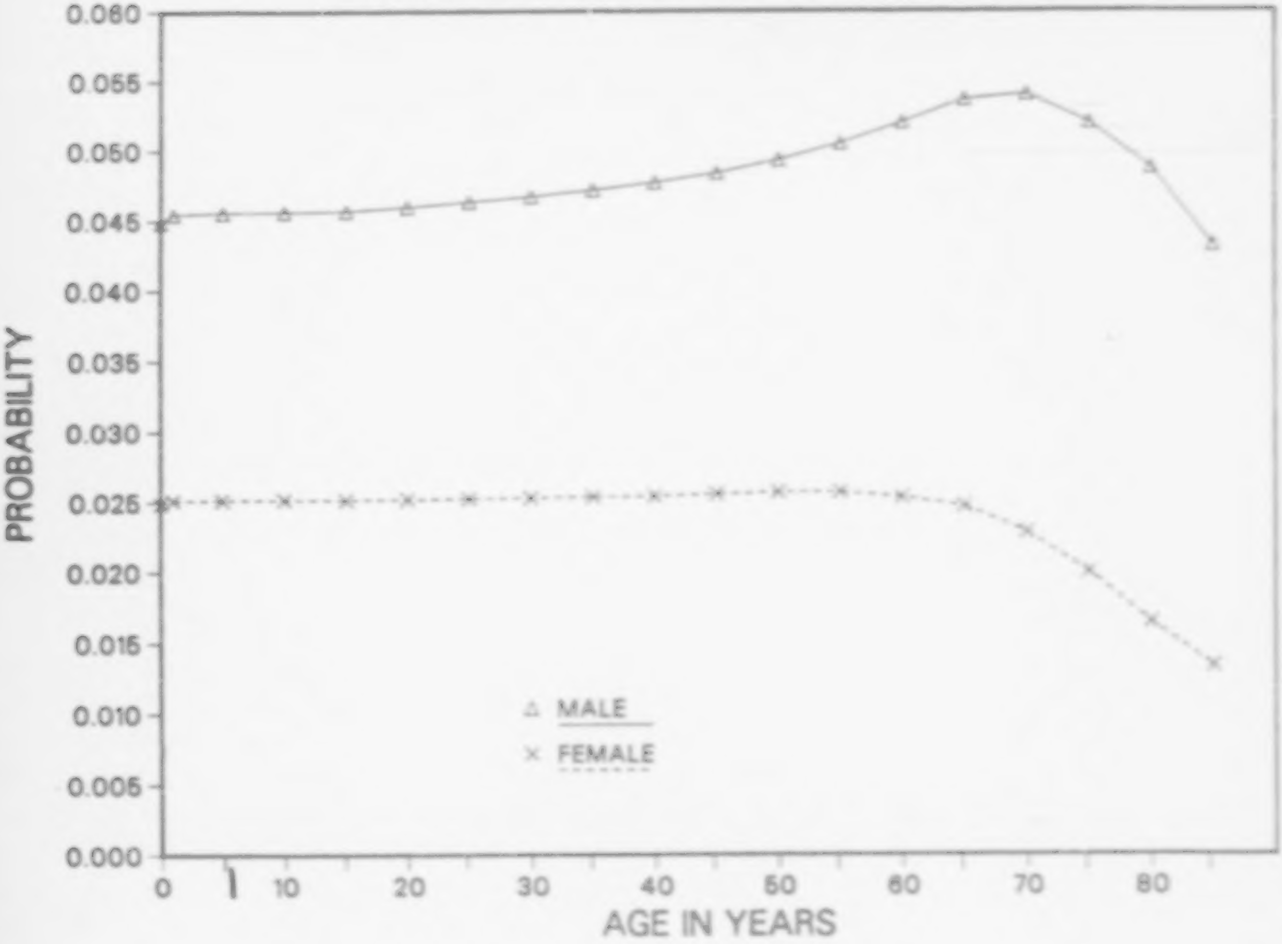
Table 2.31
Deaths Due to Chronic Obstructive Pulmonary Diseases And Allied Conditions by Specific Cause, Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
174	Chronic Airways Obstruction, not elsewhere classified	1,872	65.2
171	Emphysema	701	24.4
172	Asthma	130	4.5
170	Chronic Bronchitis	127	4.4
169	Bronchitis, not Specified as Acute or Chronic	21	0.7
173	Bronchiectasis and Extrinsic Allergic Alveolitis	19	0.7
	Total	2,870	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

to 0.043. The probability for females remains stable from birth through ages 65-69 and then declines in the oldest age groups (Figure 2.28). By age 85 and over, the probability for females declines to 0.013.

FIGURE 2.28
PROBABILITY OF EVENTUALLY DYING FROM CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

PNEUMONIA AND INFLUENZA

One of every 32 deaths that occurred to Michigan residents in 1986 was due to pneumonia and influenza. There were a total of 2,513 such deaths of which 1,290 (51.3 percent) were to females (Table 2.32).

The overall median age at death in 1986 for those dying from pneumonia and influenza was 82 years. This is well above the median age of 73 years for all deaths. The median ages at death for white persons were significantly higher than those for black persons. The median age for white males (80) was 9 years greater than that for black males (71), while for white females the median of 85 years exceeded by 11 years that for black females. There were a total of seven deaths due to pneumonia and influenza for persons of other races. The median age at death for persons of other races dying from these diseases was 74 years.

The overall crude death rate for pneumonia and influenza deaths in 1986 was 27.5, compared to a rate of 24.5 in 1985. The crude rate for males and females was the same as the overall crude rate. On an age-adjusted basis, the male rate exceeded the female rate by 69.2 percent (Table 2.33).

The age-specific death rates for males and females given in Table 2.33 are graphically displayed in Figure 2.29. Pneumonia and influenza death rates increased rapidly beyond age 44. Male rates were higher than female rates for ages above 34.

The crude rates given in Table 2.33 indicate that a greater proportion of the white population died of pneumonia and influenza in 1986 than was the case for the black population. On an age-adjusted basis, however, the rate for the black group was 48.8 percent above that for the white group. Age-specific data indicate that the rates for the black population were higher for all age groups with sufficient data to calculate rates up to age 75. Among persons 75 years or over, the pneumonia and influenza death rate was higher for white persons (Figure 2.30).

Pneumonia and influenza death rates have declined markedly since 1900 both nationally and in Michigan (Figure 2.31). Although the annual rate was quite erratic from 1900 through 1949, the Michigan rates declined 78.1 percent from a rate of 120.3 in 1900 to 26.3 in 1949. Nationally the rate declined 85.2 percent from a rate of 202.1 in 1900 to 30.0 in 1949. Since that time the rate has been fairly stable with mild year to year variation.

Michigan's rate of death due to this cause has been below the national rate every year throughout this century except 1920 and 1923. In 1900, the rate in Michigan was 40.5 percent below the national statistic. The peak year for both was 1918 when the rates for the United States and Michigan were 588.5 and 399.8, respectively. In 1979 century low rates of 15.9 for Michigan and 20.1 for the nation were recorded. Michigan's rate of 27.5 in 1986 was 6.2 percent below the provisional rate of 29.2 for the United States.

Michigan's age-adjusted death rate for pneumonia and influenza has been below that for the nation every year between 1970 and 1982 and again in 1984 and 1985 (Table 2.34). In 1986 the Michigan age-adjusted rate was

Table 2.32
Deaths Due to Pneumonia and Influenza by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	13	7	6	9	5	4	4	2	2	-	-	-
1-4	6	3	3	4	3	1	2	-	2	-	-	-
5-9	4	1	3	3	1	2	1	-	1	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	4	1	3	4	1	3	-	-	-	-	-	-
20-24	13	6	7	11	5	6	2	1	1	-	-	-
25-29	12	6	6	10	4	6	2	2	-	-	-	-
30-34	21	9	12	14	6	8	7	3	4	-	-	-
35-39	21	14	7	9	5	4	12	9	3	-	-	-
40-44	21	13	8	11	5	6	10	8	2	-	-	-
45-49	27	14	13	11	6	5	16	8	8	-	-	-
50-54	42	24	18	33	21	12	9	3	6	-	-	-
55-59	58	33	25	43	26	17	14	7	7	1	-	1
60-64	109	71	38	86	59	27	23	12	11	-	-	-
65-69	134	85	49	114	73	41	19	11	8	1	1	-
70-74	212	131	81	178	108	70	32	22	10	2	1	1
75-79	363	210	153	333	194	139	30	16	14	-	-	-
80-84	455	233	222	424	215	209	31	18	13	-	-	-
85-89	497	201	296	462	184	278	33	15	18	2	2	-
90+	501	161	340	475	153	322	25	7	18	1	1	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	2,513	1,223	1,290	2,234	1,074	1,160	272	144	128	7	5	2
Median Age At Last Birthday	82	79	84	83	80	85	72	71	74	74	89	74

[1] Deaths with race not stated are included only in the total column.

Table 2.33
Pneumonia and Influenza Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	27.5	27.5	27.5	28.6	28.1	29.1	22.2	24.9	19.7
Under 1 Year	9.4	9.9	8.9	7.9	8.6	*	*	*	*
1-14 Years	0.5	*	0.6	0.4	*	*	*	*	*
15-24 Years	1.1	0.9	1.3	1.2	0.9	1.4	*	*	*
25-34 Years	2.1	1.9	2.3	1.8	1.5	2.1	4.3	5.2	*
35-44 Years	3.4	4.5	2.4	1.9	1.9	1.9	14.8	25.6	6.1
45-54 Years	7.7	8.8	6.8	5.6	7.0	4.3	24.9	24.5	25.2
55-64 Years	20.1	26.3	14.5	17.6	24.2	11.5	40.9	45.7	36.7
65-74 Years	55.9	79.3	37.5	52.8	74.3	35.8	82.0	121.7	51.3
75-84 Years	259.8	373.4	191.1	265.5	383.0	195.1	216.7	304.2	159.0
85 Years and Over	961.5	1186.5	857.9	988.3	1221.1	892.8	676.2	778.5	626.0
Age-Adjusted Rate[2]	13.7	18.1	10.7	12.9	17.3	10.1	19.2	24.7	15.2

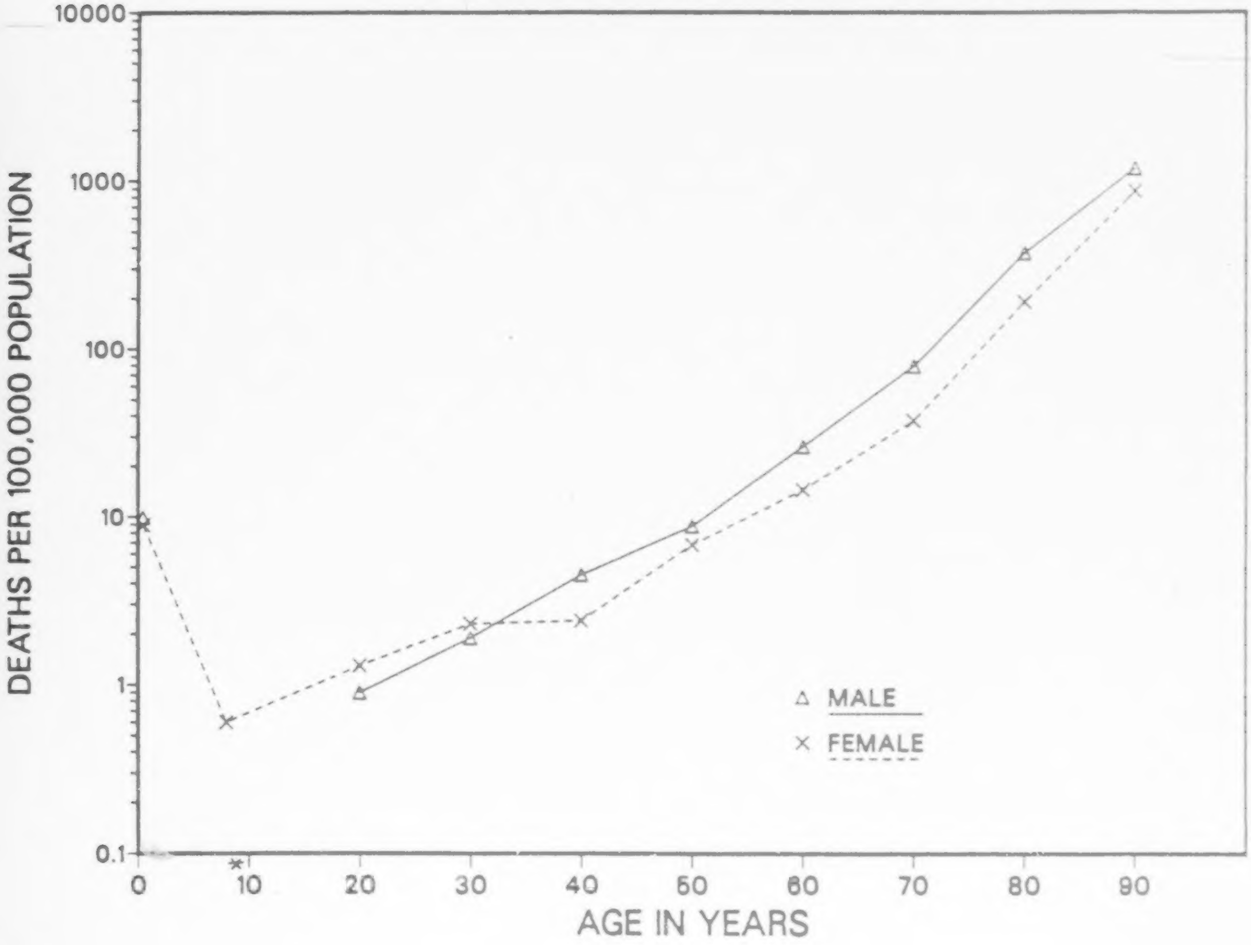
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.29
AGE-SPECIFIC PNEUMONIA AND INFLUENZA DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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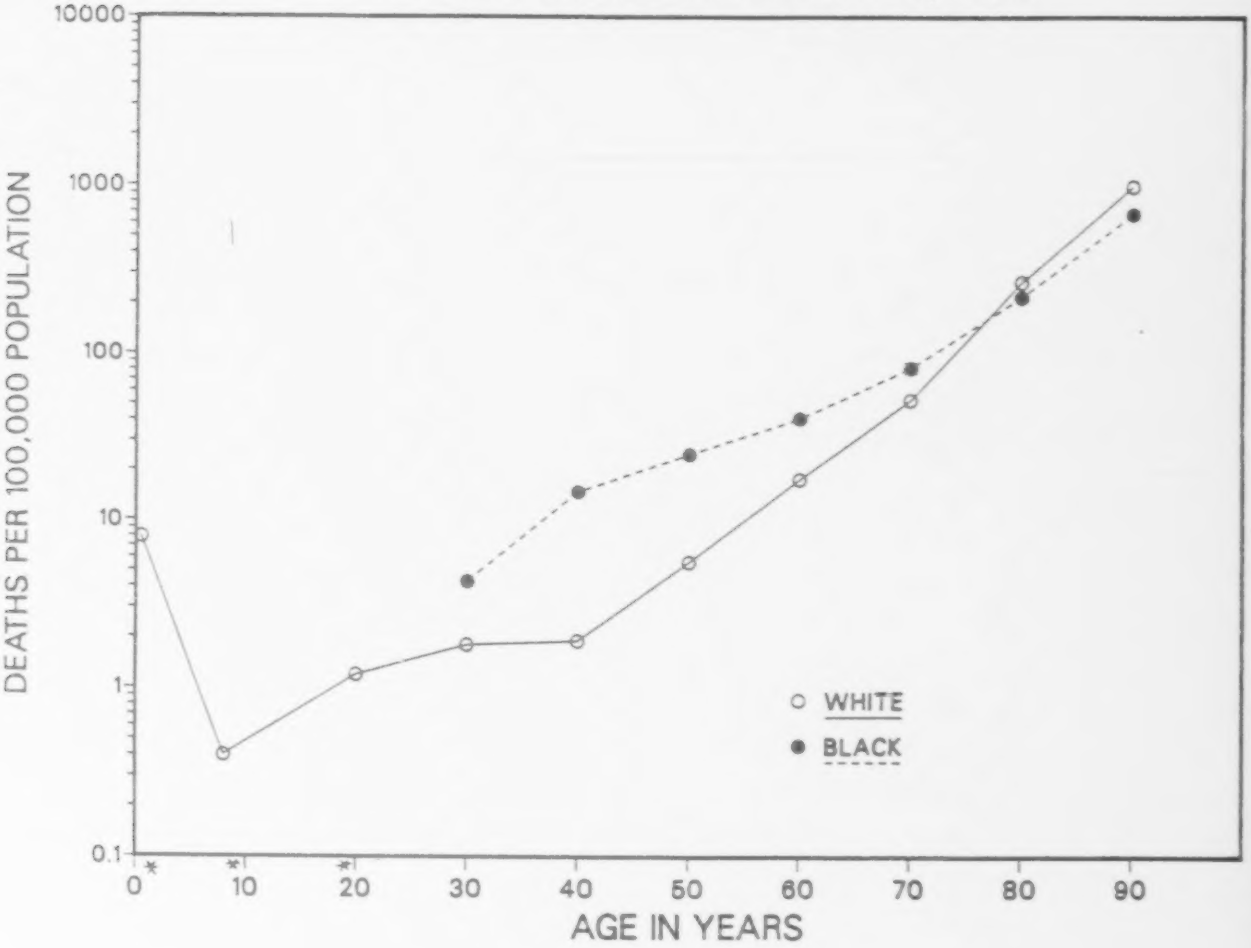
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.30

AGE-SPECIFIC PNEUMONIA AND INFLUENZA DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1986



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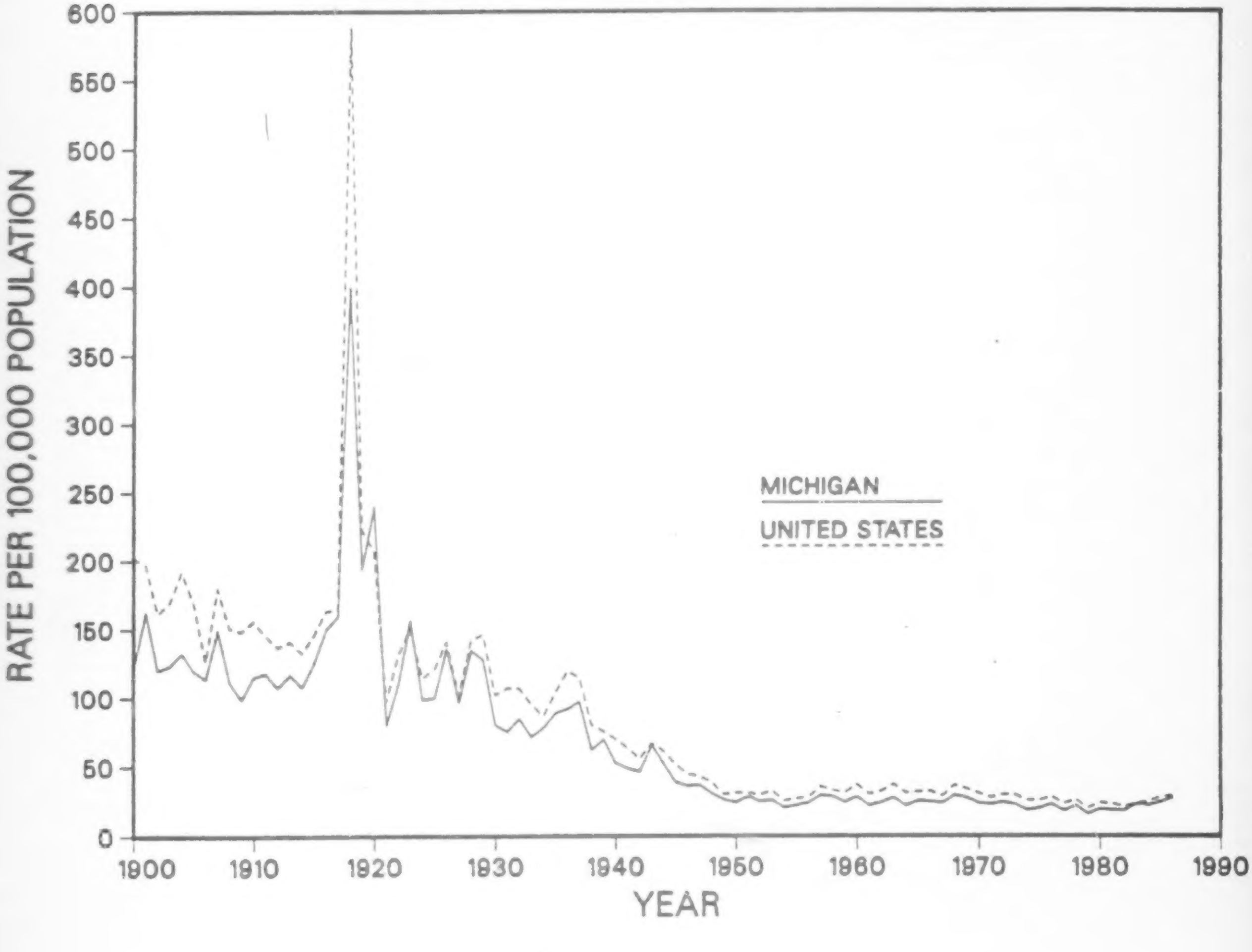
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.31

PNEUMONIA AND INFLUENZA DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] Pneumonia and influenza death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.34

Age-Adjusted Pneumonia and Influenza Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986[3]

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	19.2	24.7	14.6	16.7	21.8	12.5	38.8	47.9	30.8
	1971	17.7	23.9	12.7	15.4	20.6	11.3	36.0	50.7	23.1
	1972	18.7	25.7	12.9	16.8	23.1	11.8	33.1	47.3	20.7
	1973	17.0	21.9	13.2	14.9	19.4	11.5	34.2	43.3	26.5
	1974	13.3	17.7	10.0	12.0	15.7	9.5	22.9	34.0	13.7
	1975	14.0	18.6	10.6	13.0	17.1	10.0	21.8	29.6	15.1
	1976	15.7	20.8	12.5	14.8	19.5	11.5	22.2	30.5	15.4
	1977	12.2	17.6	8.2	11.4	16.4	7.8	17.8	26.1	11.0
	1978	14.1	18.1	11.7	13.7	17.6	11.0	16.2	21.1	12.3
	1979	9.6	13.3	7.1	8.9	12.3	6.7	14.4	19.9	9.8
	1980	11.7	16.1	9.6	10.8	14.5	8.2	18.8	28.4	11.2
	1981	10.2	14.4	7.1	9.3	13.0	7.0	16.6	24.8	10.3
	1982	10.1	14.4	7.1	9.5	13.6	7.0	14.2	20.1	9.8
	1983	12.0	16.8	8.8	11.3	15.5	8.4	17.4	25.9	10.9
	1984	12.0	16.8	8.8	11.3	15.9	8.3	17.3	23.7	12.4
	1985	12.4	16.8	9.1	11.8	16.2	8.9	15.9	21.0	12.0
	1986	13.7	18.1	10.7	12.9	17.3	10.1	18.3	23.6	14.4
U.S.	1970	22.1	28.8	16.7	19.8	26.0	15.0	38.1	50.1	27.9
	1971	19.2	25.1	14.6	17.5	22.8	13.4	31.6	42.2	22.6
	1972	20.7	27.5	15.5	19.0	25.3	14.4	32.4	44.3	22.6
	1973	19.9	26.4	15.0	18.3	24.4	13.9	31.0	42.0	22.2
	1974	16.8	22.4	12.6	15.6	20.8	11.8	25.1	34.9	17.2
	1975	16.4	22.2	12.1	15.4	20.8	11.5	23.6	33.4	15.8
	1976	17.1	22.9	13.0	16.1	21.5	12.4	24.0	33.5	16.5
	1977	13.9	19.1	10.2	13.0	17.8	9.6	20.6	29.5	13.6
	1978	15.1	20.6	11.3	14.2	19.3	10.7	21.4	30.8	14.2
	1979	11.2	15.4	8.2	10.5	14.4	7.8	15.8	22.8	10.5
	1980	12.9	17.4	9.8	12.2	16.2	9.4	18.0	26.1	11.9
	1981	12.3	16.6	9.2	11.6	15.6	9.0	16.3	24.0	10.5
	1982	10.9	15.2	8.0	10.3	14.3	7.6	14.4	21.1	9.5
	1983	11.8	16.2	8.8	11.3	15.3	8.6	14.9	22.1	9.6
	1984	12.2	16.7	9.1	11.6	15.8	8.8	15.8	23.0	10.5
	1985	13.4	18.2	10.1	12.8	17.4	9.8	16.8	24.2	11.4
	1986[4]	13.6	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates (see Technical Notes).

[3] The introduction in 1979 of the 9th Revision of the International Classification of Diseases, WHO, for coding causes of death resulted in substantial changes in this category, making trend comparisons difficult. The estimated comparability ratio for this category is 0.9264. Note that comparability ratios were developed for comparing crude death rates, and they are not strictly applicable for comparing age-adjusted death rates. For further discussion of comparability ratios see Qualifications and Limitations of Data and Calculations.

[4] Provisional Data.

0.7 percent above the provisional national rate. Between 1970 and 1986 the age-adjusted rate for Michigan declined by 28.6 percent.

Age-adjusted rates for other than white persons declined more rapidly than rates for white persons. The decline was most pronounced for other than white females for whom the age-adjusted rate dropped 61.0 percent between 1970 and 1985. In 1986 the rate for other than white females was the highest rate since 1976. The decline in the age-adjusted rate for other than white males was 50.7 percent between 1970 and 1986. The declines in rates for other than white males and females were mirrored by strong declines in the rates for the United States.

The majority of deaths due to pneumonia and influenza were not attributed to a specific organism. Pneumonia due to other and unspecified organisms (1,958) accounted for 77.9 percent of all Michigan pneumonia and influenza deaths in 1986 (Table 2.35). Another 8.2 percent of the deaths were due to bronchopneumonia, organism unspecified, and 7.8 percent were due to pneumococcal and other bacterial pneumonia. The three most frequent categories of pneumonia and influenza deaths together accounted for 93.9 percent of all such deaths. Influenza was the direct cause of 4.9 percent of the pneumonia and influenza deaths in 1986, compared to 1.6 percent in 1985.

Table 2.35
Deaths Due to Pneumonia and Influenza by Specified Cause, Michigan Residents, 1986

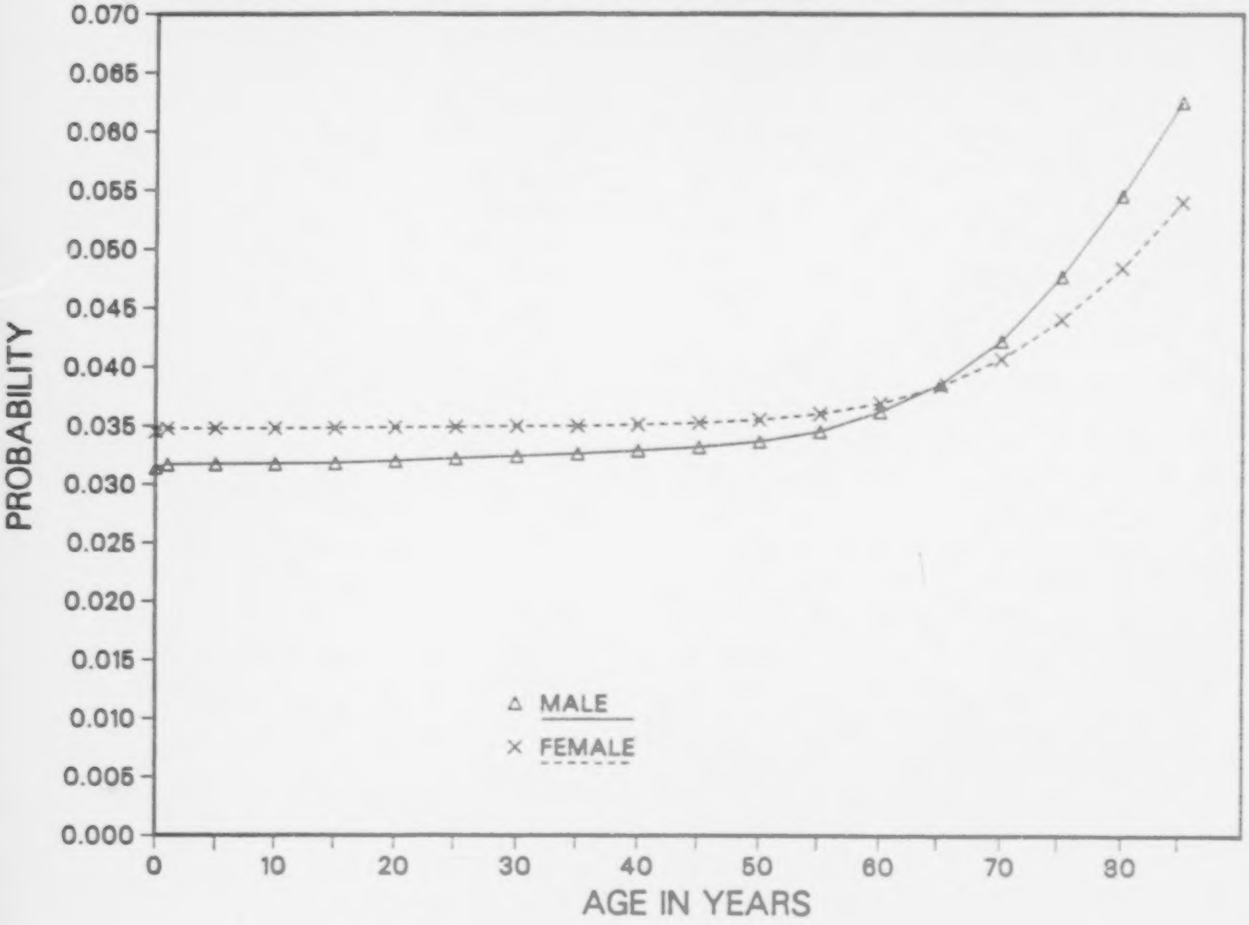
282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
167	Pneumonia due to Other and Unspecified Organism	1,958	77.9
166	Bronchopneumonia, Organism Unspecified	206	8.2
165	Pneumococcal and Other Bacterial Pneumonia	195	7.8
168	Influenza	124	4.9
164	Viral Pneumonia	30	1.2
	Total	2,513	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

The likelihood of eventual death being caused by pneumonia and influenza is 0.035 for females and between 0.031 and 0.033 for males from birth to age 49. The calculated probabilities for each sex increase after this age, with probabilities for males increasing more rapidly than those for females. Based on the Michigan mortality experience of 1984-1986 at ages 85 and above, the chances of eventually dying from pneumonia and influenza are 0.063 for males and 0.054 for females (Figure 2.32).

FIGURE 2.32

PROBABILITY OF EVENTUALLY DYING FROM PNEUMONIA AND INFLUENZA BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

DIABETES MELLITUS

In 1986 1,494 Michigan resident deaths were attributed to diabetes mellitus, the seventh leading cause of death. This was 107 more deaths than were caused by this disease in 1985. Deaths to females numbered 863 or 57.8 percent of all diabetes mellitus deaths.

The median age at death for persons dying from diabetes mellitus was 73 years (Table 2.36). This is equal to the median age of all deaths. Males dying from this disease had a median age of 70 years, whereas the median for females was 74 years. The median for white males was 71 years compared to 76 years for white females. For black males and females the medians were 66 and 67 years, respectively.

Diabetes mellitus death rates by age, race, and sex are presented in Table 2.37. The diabetes mellitus crude death rate was 16.3 in 1986. The crude rate for females was 18.4, 29.6 percent higher than the rate of 14.2 for males. When age-adjusted rates are examined, however, the rate for males was 7.7 percent higher than the rate for females.

Age-specific mortality rates for males and females presented in Table 2.37 are graphically displayed in Figure 2.33. Rates for males were similar to or greater than those for females through age 74. Above age 74, male rates were less than female rates. Rates for both sexes increased steadily with advancing age.

The crude diabetes mellitus death rate for black persons was 17.4 percent above that of white persons (18.9 compared to 16.1). The age-adjusted rate for the black population was 79.0 percent higher than that for the white population. The age-adjusted rate for black females exceeded that of their white counterparts by 90.5 percent, while the age-adjusted rate for black males was 68.3 percent greater than that of white males.

Age-specific rates for black persons were higher than those for white persons for all age groups with sufficient number of events to calculate rates (Figure 2.34). The greatest relative differential occurred for ages 35 through 44, where the rate for black persons was more than three times the rate for white persons.

Diabetes mellitus death rates in Michigan rose steadily from a low of 9.3 in 1900 to a peak of 29.7 in 1949 (Figure 2.35). Adoption of the 6th revision of the International Classification of Diseases in 1950 caused a significant change in Michigan diabetes death rates. From 22.6 in 1950 the rate dipped somewhat then rose to a peak of 27.0 in 1966. Since then the rate has declined 39.6 percent to 16.3 in 1986.

The national range in diabetes mellitus death rates in the first half of this century was from 11.0 in 1900 to 27.1 in 1943. The rate for the nation since 1949, though more stable than Michigan's rate, has tended to follow the same pattern. A peak of 19.2 was reached in 1968. Since that time the rate for the nation has declined by 21.4 percent to a provisional rate of 15.1 in 1986.

The diabetes mellitus death rate for the nation was generally above Michigan's rate for the first 25 or so years in this century. For the 41 years from 1942 through 1982, Michigan's rate was above that of the nation. Through the 1960's the differential between the rates for Michigan and the United States was quite

Table 2.36
Deaths Due to Diabetes Mellitus by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	1	1	-	-	-	-	1	1	-	-	-	-
20-24	2	1	1	2	1	1	-	-	-	-	-	-
25-29	13	8	5	8	5	3	5	3	2	-	-	-
30-34	14	7	7	11	7	4	3	-	3	-	-	-
35-39	28	15	13	15	8	7	13	7	6	-	-	-
40-44	31	15	16	26	11	15	5	4	1	-	-	-
45-49	31	23	8	26	21	5	5	2	3	-	-	-
50-54	63	30	33	50	27	23	12	2	10	1	1	-
55-59	109	55	54	85	42	43	23	13	10	-	-	-
60-64	134	68	66	101	55	46	31	11	20	2	2	-
65-69	188	84	104	153	68	85	35	16	19	-	-	-
70-74	228	99	129	198	86	112	30	13	17	-	-	-
75-79	211	82	129	187	75	112	24	7	17	-	-	-
80-84	226	81	145	200	68	132	25	12	13	1	1	-
85-89	118	33	85	106	29	77	11	3	8	1	1	-
90+	97	29	68	87	24	63	9	5	4	1	-	1
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1,494	631	863	1,255	527	728	232	99	133	6	5	1
Median Age At Last Birthday	73	70	74	73	71	76	67	66	67	81	64	94

[1] Deaths with race not stated are included only in the total column.

Table 2.37
Diabetes Mellitus Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	16.3	14.2	18.4	16.1	13.8	18.3	18.9	17.1	20.5
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	*	*	*	*	*	*	*	*	*
25-34 Years	1.7	1.9	1.5	1.4	1.8	1.1	3.8	*	4.3
35-44 Years	4.8	5.0	4.6	3.8	3.6	4.1	12.1	16.5	8.5
45-54 Years	10.5	12.2	8.9	9.7	12.5	7.0	16.9	*	23.4
55-64 Years	29.3	31.1	27.6	25.5	27.6	23.5	59.6	57.8	61.2
65-74 Years	67.2	67.2	67.2	63.4	63.2	63.6	104.5	107.0	102.6
75-84 Years	138.8	137.4	139.6	135.7	133.9	136.8	174.0	170.0	176.7
85 Years and Over	207.1	203.2	208.8	203.6	192.0	208.3	233.2	283.1	208.7
Age-Adjusted Rate[2]	10.8	11.2	10.4	10.0	10.4	9.5	17.9	17.5	18.1

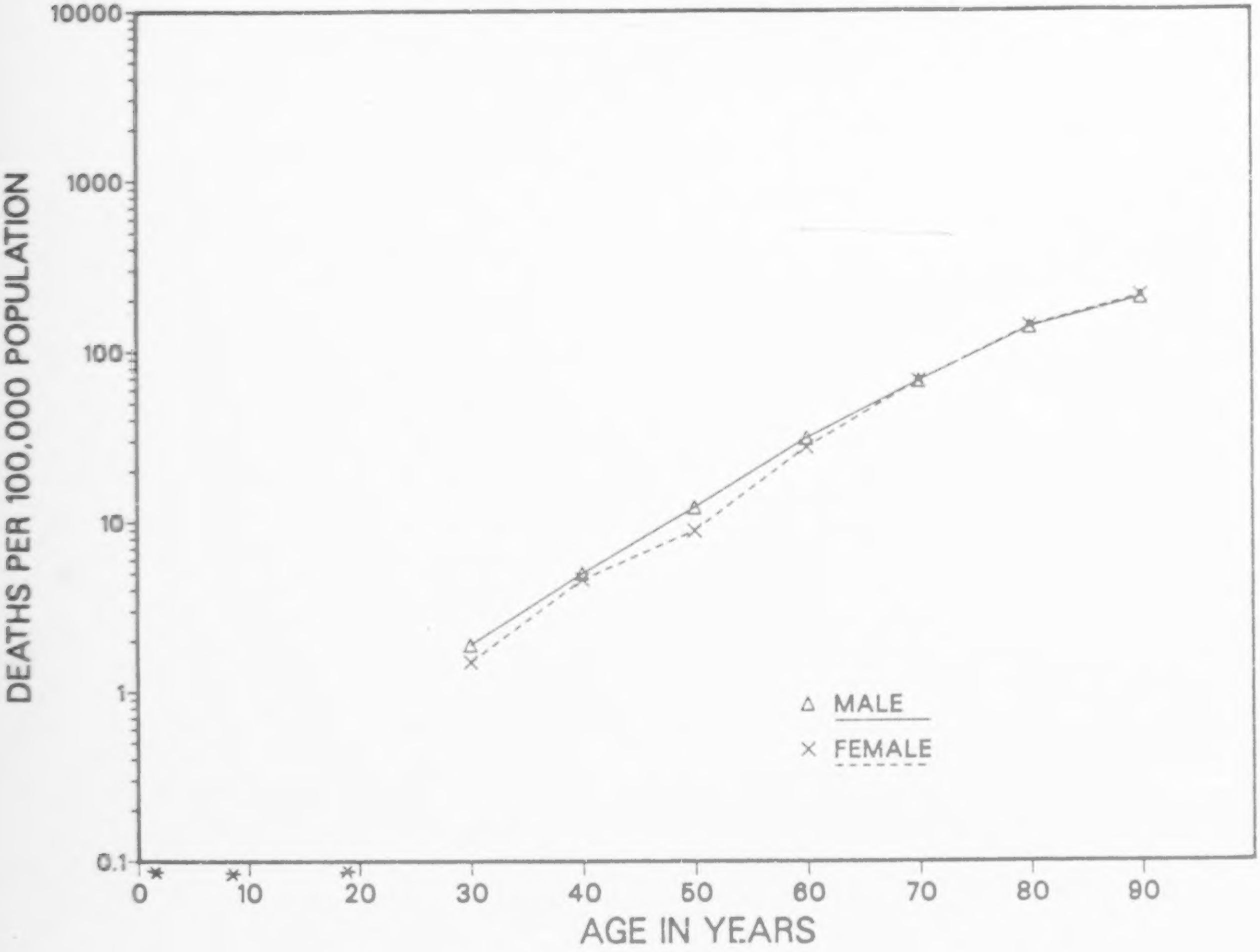
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.33
AGE-SPECIFIC DIABETES MELLITUS DEATH RATES[1]
BY SEX, MICHIGAN RESIDENTS, 1986



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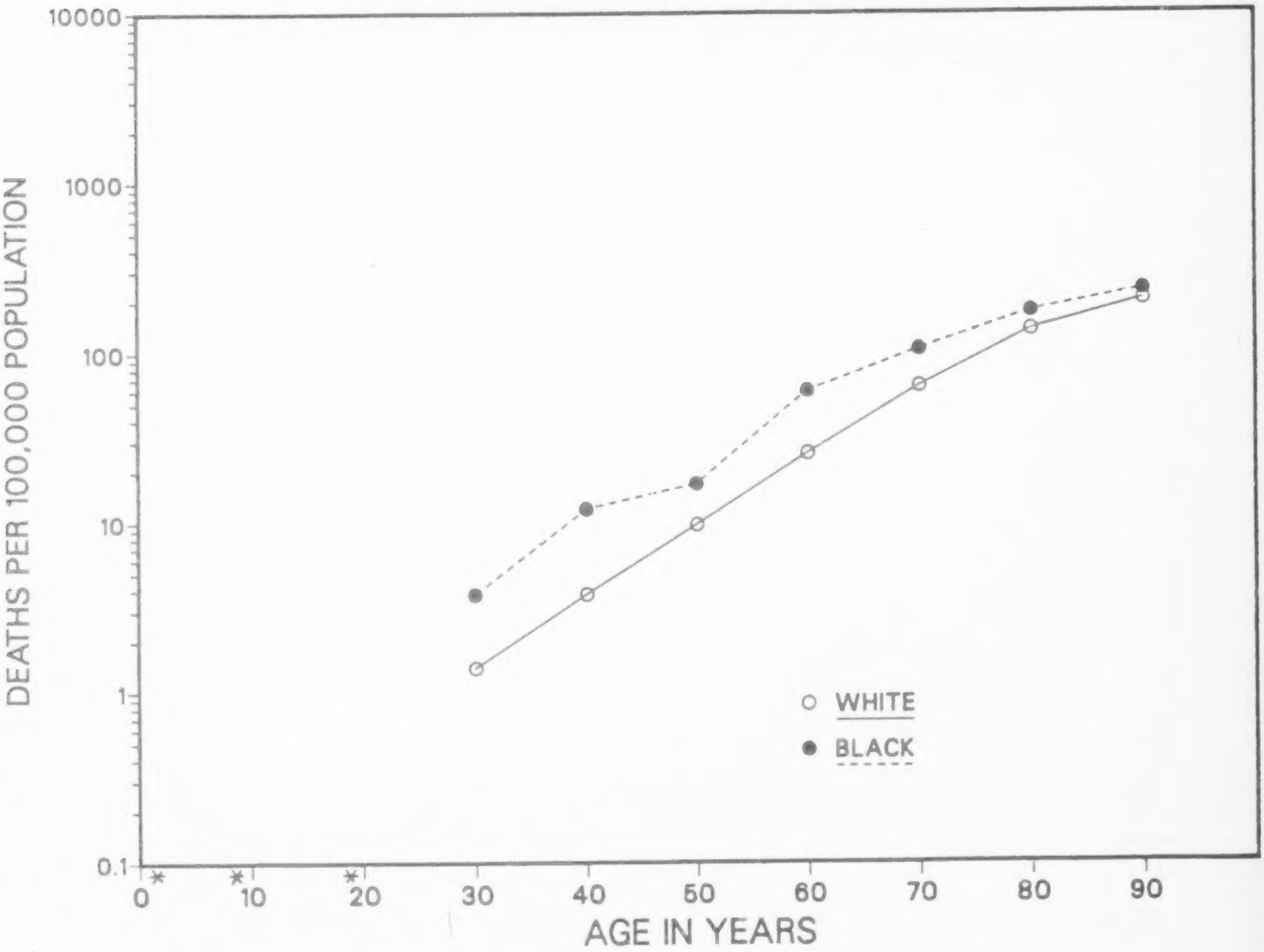
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.34
AGE-SPECIFIC DIABETES MELLITUS DEATH RATES[1]
BY RACE, MICHIGAN RESIDENTS, 1986



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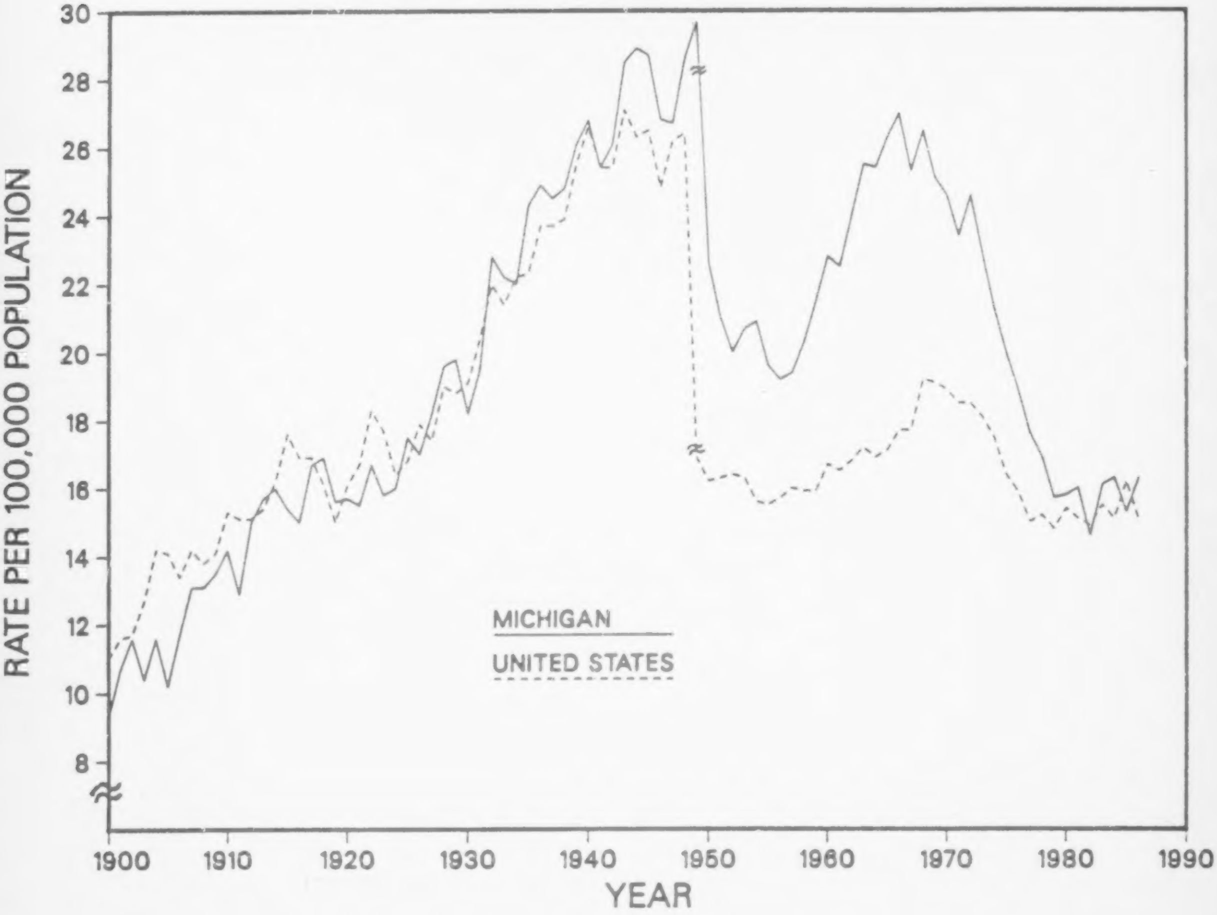
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.35

DIABETES MELLITUS DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] The comparability of diabetes mellitus death rates from the 5th revision of the ICDA coding procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be .55. The 6th revision was adopted in 1949 for national cause-of-death statistics and in 1950 for Michigan statistics. The comparability of diabetes mellitus death rates through the 6th, 7th, 8th, and 9th revisions (1949 to date nationally and 1950 to date in Michigan) is high. General comparison before and after these dates of adoption can be made but detailed study requires special consideration. See Technical Notes.

Table 2.38
Age Adjusted Diabetes Mellitus Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	20.2	20.8	19.8	18.8	19.9	17.7	34.3	29.1	39.4
	1971	18.9	17.4	20.1	17.5	16.6	18.1	31.2	23.8	37.7
	1972	19.6	18.7	20.2	18.1	17.7	18.4	32.0	27.5	36.2
	1973	18.0	17.4	18.2	16.7	16.4	16.8	28.3	25.5	30.6
	1974	16.2	16.0	16.3	15.7	15.8	15.5	20.2	17.5	22.5
	1975	14.9	14.8	14.9	14.2	14.2	14.0	21.1	19.8	22.3
	1976	13.8	13.7	13.8	12.7	12.6	12.7	22.7	22.5	22.9
	1977	12.9	13.3	12.5	12.1	12.6	11.6	19.8	19.3	20.3
	1978	12.1	12.3	11.8	11.1	11.7	10.4	20.6	16.7	23.5
	1979	11.2	11.1	11.2	10.7	11.2	10.3	14.7	10.5	18.2
	1980	11.2	11.0	11.3	10.5	10.6	10.4	16.8	14.5	18.5
	1981	10.7	11.5	10.3	10.1	11.0	9.5	15.7	15.3	16.2
	1982	9.6	10.0	9.3	9.1	9.7	8.6	13.8	12.6	14.9
	1983	10.7	10.6	10.9	10.2	10.0	10.3	15.4	14.8	15.6
	1984	10.8	11.2	10.5	9.9	10.7	9.2	17.7	15.1	19.6
	1985	10.0	10.5	9.5	9.0	9.8	8.4	16.8	15.8	17.7
	1986	10.8	11.2	10.4	10.0	10.4	9.5	17.1	17.2	17.0
U.S.	1970	14.1	13.5	14.4	12.9	12.7	12.8	25.2	20.4	29.3
	1971	13.7	13.2	14.0	12.3	12.4	12.2	25.6	20.3	30.0
	1972	13.5	13.1	13.7	12.2	12.2	12.0	25.9	21.1	29.7
	1973	13.0	12.8	13.1	11.7	11.9	11.5	25.0	21.0	28.2
	1974	12.4	12.1	12.6	11.2	11.4	11.0	23.1	18.7	26.6
	1975	11.4	11.3	11.4	10.3	10.6	10.0	21.3	17.8	23.9
	1976	10.9	10.8	10.9	9.8	10.0	9.5	20.5	17.4	22.9
	1977	10.2	10.3	10.1	9.2	9.7	8.8	19.0	16.2	21.2
	1978	10.2	10.3	10.0	9.2	9.7	8.8	18.5	16.2	20.2
	1979	9.8	10.0	9.5	8.8	9.3	8.3	18.1	16.1	19.5
	1980	10.1	10.2	10.0	9.1	9.5	8.7	18.8	16.4	20.6
	1981	9.8	10.0	9.6	8.8	9.3	8.4	17.9	15.6	19.5
	1982	9.6	9.8	9.3	8.7	9.2	8.3	16.7	14.7	18.1
	1983	9.9	9.9	9.8	8.9	9.2	8.6	17.8	16.0	19.0
	1984	9.5	9.8	9.3	8.5	9.0	8.0	17.4	16.0	18.4
	1985	9.6	9.9	9.1	8.6	9.2	8.1	17.7	16.1	18.9
	1986[3]	9.4	---	---	---	---	---	---	---	---

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[1] Based on age specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes)

[3] Provisional Data.

large. In 1982 and again in 1985 the Michigan rates were below the United States rates. In 1986 Michigan's rate (16.3) was 7.9 percent above the provisional rate of 15.1 for the United States.

Age-adjusted death rates for diabetes mellitus for the years 1970-1986 are presented in Table 2.38. These rates have generally declined both in Michigan and the United States for all population groups. The rate for the total population of Michigan has declined by 46.5 percent since 1970. The rate for the United States declined by 33.3 percent between 1970 and 1986.

The declines in the age-adjusted rates for other than white persons were much greater in Michigan than those observed for these groups nationally. Michigan's rates for other than white persons were higher than comparable rates for the nation in 1970, and were lower than those for the nation between 1979 and 1983 and again in 1985. In 1984 the Michigan rate for other than white persons exceeded the national rate. Age-adjusted rates for white persons in Michigan also declined more sharply than comparable rates for the nation. However, they remained higher than those of the nation throughout the period.

In 1986 75.4 percent of all diabetes mellitus deaths were without mention of complication (Table 2.39). Diabetes with renal manifestations caused 115 deaths, while diabetes with peripheral circulatory disorders resulted in an additional 88 deaths. There were 114 deaths in 1986 from diabetes with ketoacidosis or coma, which were deaths where a diabetic crisis was involved.

At birth, the probability of eventual death due to diabetes mellitus is 0.015 for males and 0.022 for females (Figure 2.36). The probability of death from diabetes mellitus for females is relatively stable from birth to age 69 and declines after that age. In fact, females are less likely to eventually die from this cause at ages 70 and over than when they were born. Probabilities for males are consistently less than those for females, but decline less, relatively, in the older ages.

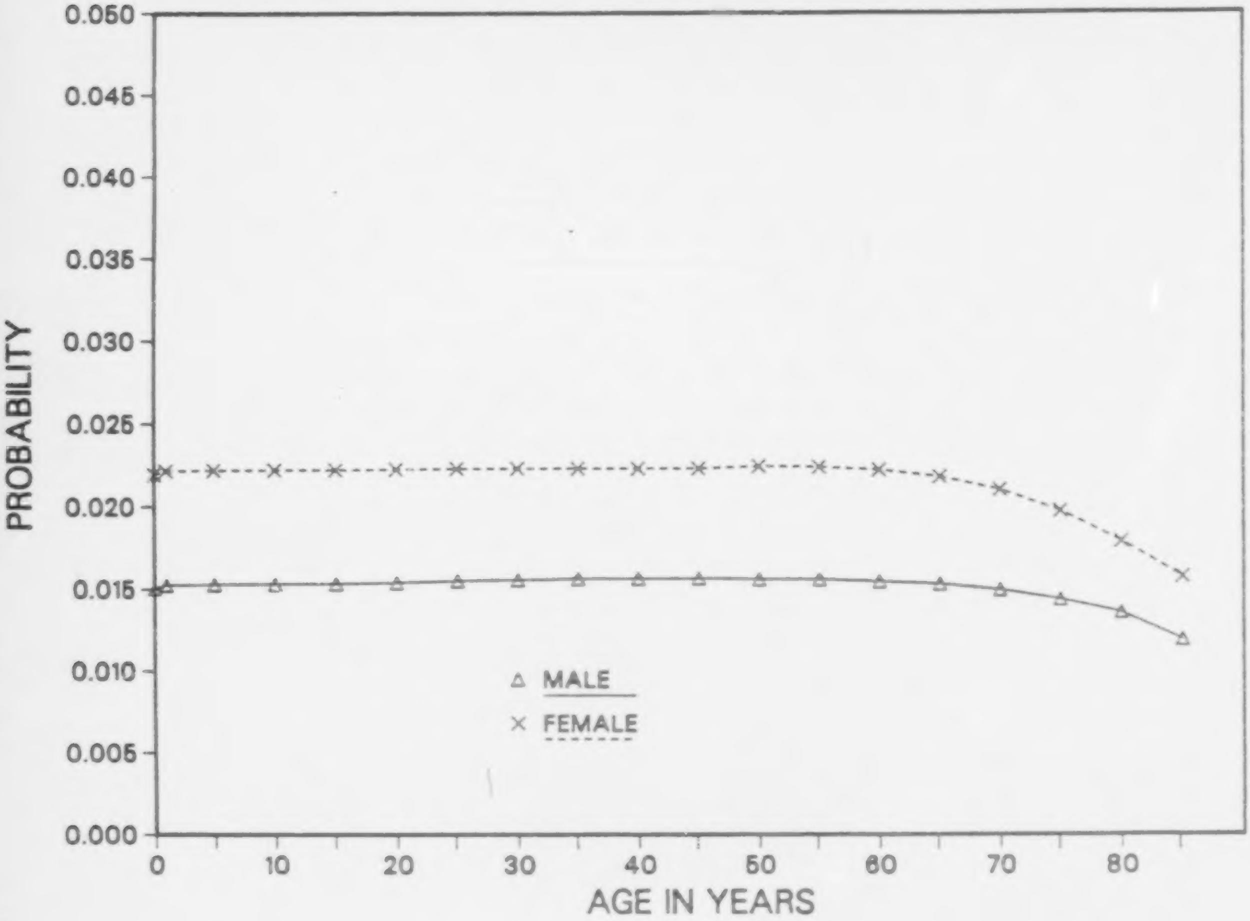
TABLE 2.39

DEATHS DUE TO DIABETES MELLITUS BY DETAILED CAUSE, MICHIGAN RESIDENTS, 1986

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
250.0	Diabetes Mellitus without Mention of Complications	1,127	75.4
250.3	Diabetes with Renal Manifestations	115	7.7
250.6	Diabetes with Peripheral Circulatory Disorders	88	5.9
250.1	Diabetes with Ketoacidosis	67	4.5
250.2	Diabetes with Coma	47	3.1
250.7	Diabetes with Other Specified Manifestations	28	1.9
250.5	Diabetes with Neurological Manifestations	17	1.1
250.4	Diabetes with Ophthalmic Manifestations	3	0.2
250.9	Diabetes with Unspecified Complications	2	0.1
	Total	1,494	100.0

[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.36
PROBABILITY OF EVENTUALLY DYING FROM DIABETES MELLITUS
BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

ATHEROSCLEROSIS

There were a total of 1,214 Michigan resident deaths attributed to atherosclerosis in 1986, making this cause the 8th leading cause of death in the state. Atherosclerosis is the term under the 9th Revision (adopted in 1979) for the category most nearly comparable to arteriosclerosis under the 8th Revision. Of the deaths due to this cause in 1986, 62.1 percent were to females, whereas 47.5 percent of the deaths due to all causes were to females. Only 86 of the 1,214 deaths were to black persons and persons of other races. This is 7.1 percent of all atherosclerosis deaths, while 14.4 percent of all deaths were to these groups.

The majority of the atherosclerosis deaths were to persons of advanced ages. The median age of all deaths resulting from this disease was 85 years. The median age at death for males was 6 years lower than that for females, and the median for black persons was 3 years lower than that for white persons (Table 2.40).

Atherosclerosis resulted in 13.3 deaths per 100,000 Michigan residents in 1986, 3.1 percent higher than the 1985 rate of 12.9. Deaths to females from this disease were relatively more frequent than for males with crude mortality rates of 16.1 and 10.3 respectively (Table 2.41). The age-adjusted rate for males, however, was 24 percent greater than that for females. Age-specific atherosclerosis death rates rose sharply beyond age 54 for persons of both sexes. Rates for males were above those for females for age groups below 85 where rates can be calculated (Figure 2.37).

The crude rate for deaths due to atherosclerosis for white persons was 2.1 times that for black persons. However, when the differing age distributions of the two groups are considered, the differential is greatly reduced (Figure 2.38). The age-adjusted rate for white persons was 17.0 percent higher than the rate for black persons. Age specific rates were higher for black persons between ages 55 to 74 years and lower after age 74 than rates for white persons.

Inspection of arteriosclerosis death rates since 1900 is far less informative than study of the historical data for other causes of death. The classification of this disease has been significantly altered several times since the inception of the ICD codes (see footnote of Figure 2.39). What can be seen in Figure 2.39 is a strong rise between 1900 and 1912. Rates in Michigan and the nation then stabilized and began declining. A coding revision in 1930 breaks comparability with 1929 rates.

The arteriosclerosis death rates from 1930 through 1948 show no clear direction. From 1950 through 1967 the rates for the nation held fairly stable while in Michigan the rates dropped and then returned to national levels. From 1968 through 1979 the death rates due to arteriosclerosis in Michigan were below national rates. Since 1980 the Michigan rate has exceeded the national rate. In 1986 the Michigan rate of 13.3 exceeded by 44.6 percent the provisional rate of 9.2 for the nation.

Age-adjusted atherosclerosis death rates have declined for all population groups in both Michigan and the United States since 1970 (Table 2.42). The rates for white Michigan residents were quite similar to those for the nation from 1970 through 1974. After 1974

Table 2.40
Deaths Due to Atherosclerosis by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	-	-	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-
30-34	1	1	-	-	-	-	1	1	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	1	-	1	1	-	1	-	-	-	-	-	-
45-49	5	4	1	3	2	1	2	2	-	-	-	-
50-54	5	3	2	5	3	2	-	-	-	-	-	-
55-59	18	10	8	14	8	6	4	2	2	-	-	-
60-64	23	14	9	20	12	8	3	2	1	-	-	-
65-69	41	23	18	37	20	17	4	3	1	-	-	-
70-74	95	42	53	84	37	47	10	5	5	1	-	1
75-79	170	90	80	156	79	77	14	11	3	-	-	-
80-84	228	94	134	216	88	128	12	6	6	-	-	-
85-89	258	90	168	239	86	153	19	4	15	-	-	-
90+	369	89	280	353	83	270	16	6	10	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1,214	460	754	1,128	418	710	85	42	43	1	-	1
Median Age At Last Birthday	85	81	87	85	82	87	82	77	85	74	-	74

[1] Deaths with race not stated are included only in the total column.

Table 2.41
Atherosclerosis Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	13.3	10.3	16.1	14.5	11.0	17.8	6.9	7.3	6.6
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	*	*	*	*	*	*	*	*	*
25-34 Years	*	*	*	*	*	*	*	*	*
35-44 Years	*	*	*	*	*	*	*	*	*
45-54 Years	1.1	1.6	*	1.0	1.3	*	*	*	*
55-64 Years	4.9	6.1	3.9	4.6	5.7	3.7	7.7	*	*
65-74 Years	22.0	23.9	20.5	21.9	23.4	20.7	22.5	29.5	17.1
75-84 Years	126.4	155.1	109.0	130.5	156.4	114.9	92.3	152.1	53.0
85 Years and Over	604.1	586.7	611.3	624.4	612.3	629.4	408.1	353.9	434.7
Age-Adjusted Rate[2]	5.5	6.2	5.0	5.5	6.1	5.1	4.7	6.5	3.4

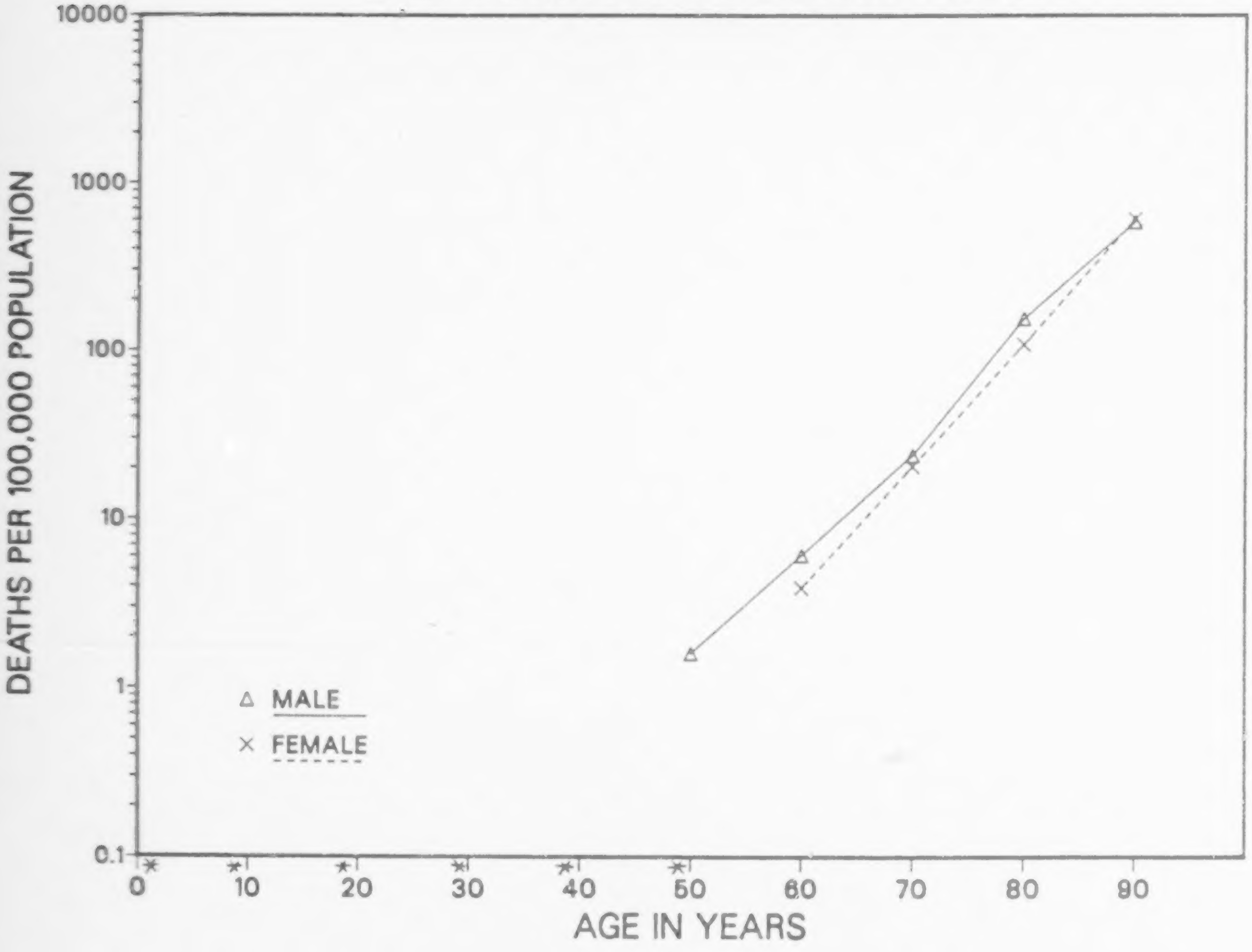
[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.37
AGE-SPECIFIC ATHEROSCLEROSIS DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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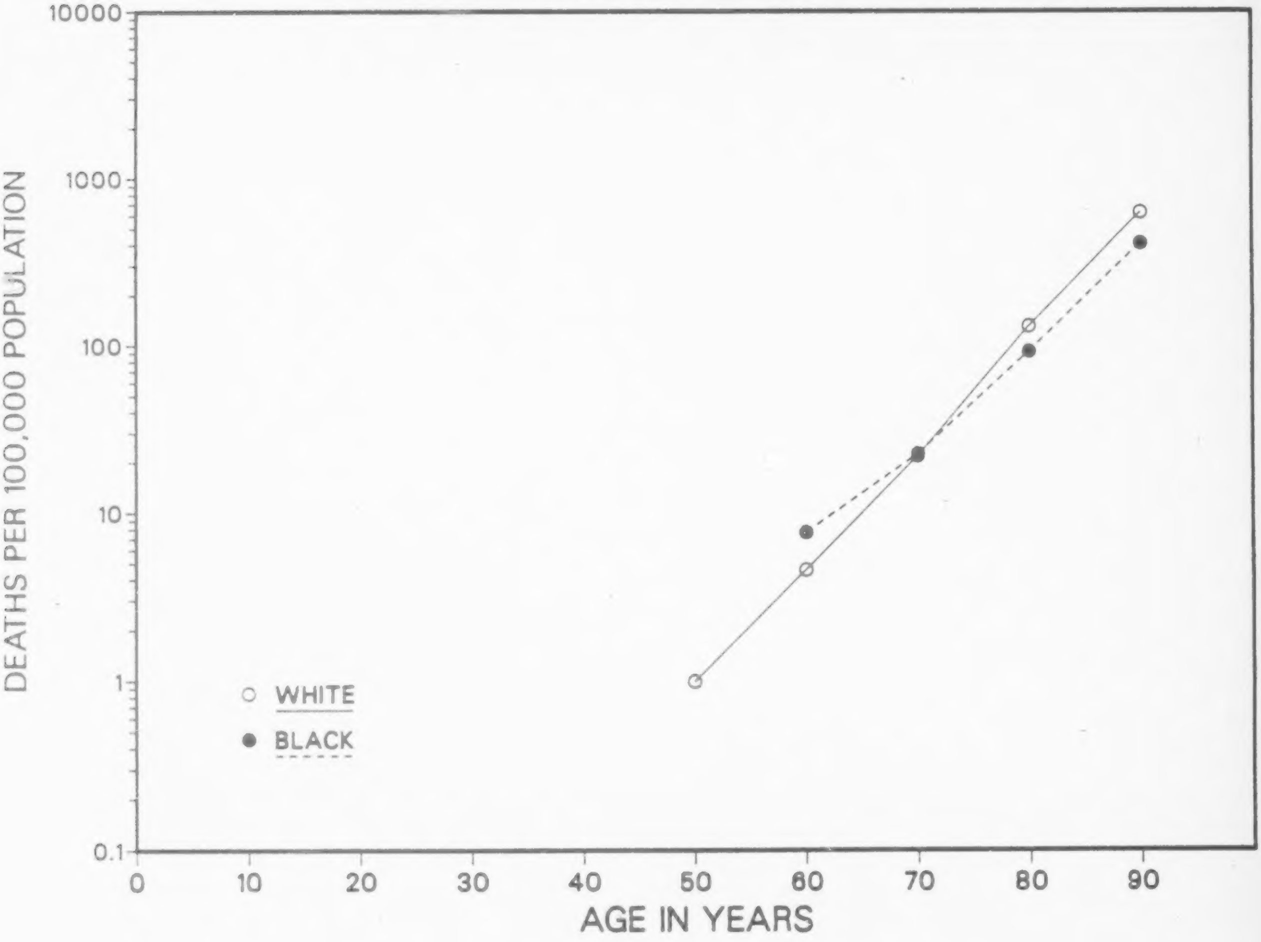
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.38
AGE-SPECIFIC ATHEROSCLEROSIS DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1986

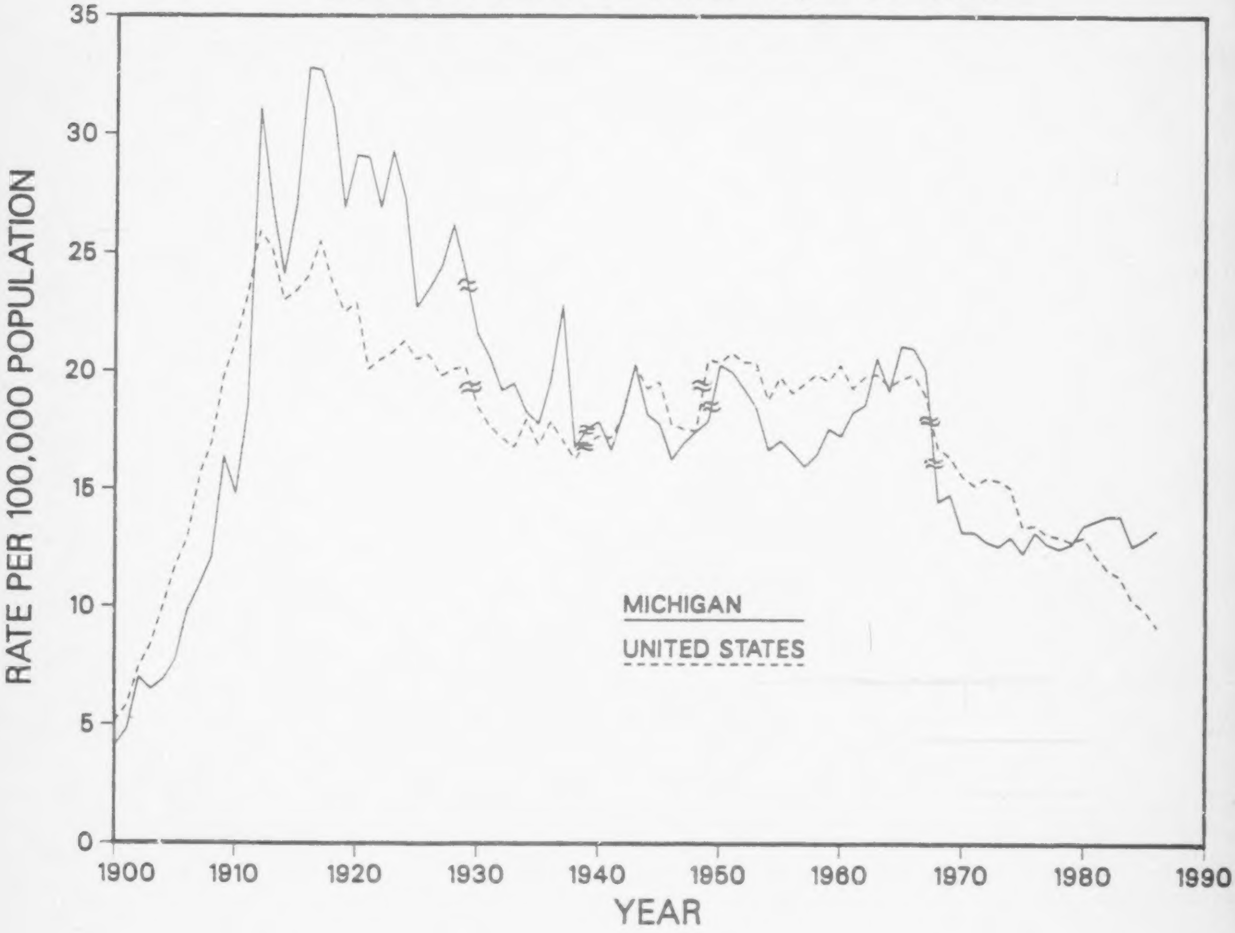


[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.39

ATHEROSCLEROSIS[1] DEATH RATES, MICHIGAN AND UNITED STATES[2] RESIDENTS, 1900-1986[3]



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[1] Prior to 1979 termed Arteriosclerosis.

[2] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[3] Although Michigan and United States atherosclerosis death rates are comparable for any given year, changes in the International Classification of Diseases over the years have made historic comparison of these rates extremely difficult. Comparability breaks are especially pronounced in the 1930, 1939, 1949, and 1968 revisions. Analysis of atherosclerosis death rates over the time period 1900-1986 requires detailed study to maintain comparability.

Table 2.42
Age-Adjusted Atherosclerosis Death Rates[1] by Race and Sex
Michigan[2] and United States Residents, 1970-1986[3]

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	8.1	8.9	7.1	8.2	9.1	7.5	6.2	6.3	5.9
	1971	7.9	9.0	7.1	8.2	9.3	7.3	4.5	4.6	4.4
	1972	7.4	8.7	6.1	7.6	9.0	6.6	4.1	4.1	4.0
	1973	7.2	8.4	6.3	7.5	8.8	6.4	4.0	3.4	4.4
	1974	7.3	8.1	6.7	7.6	8.5	6.9	4.1	4.0	4.1
	1975	6.7	7.5	6.0	6.9	7.7	6.2	4.2	5.0	3.4
	1976	7.0	8.4	6.0	7.3	8.8	6.2	3.0	3.6	2.5
	1977	6.6	7.5	6.0	6.9	7.8	6.2	3.5	3.5	3.6
	1978	6.4	7.2	5.8	6.6	7.4	5.9	4.0	4.6	3.6
	1979	6.3	7.1	5.7	6.3	7.2	5.8	5.3	6.3	4.5
	1980	6.6	7.5	6.0	6.7	7.7	6.0	5.4	5.7	5.2
	1981	5.8	6.8	5.2	6.1	7.1	5.4	3.0	3.5	2.6
	1982	5.8	6.8	5.1	6.1	7.1	5.3	3.5	4.3	2.8
	1983	5.6	6.2	5.2	5.8	6.5	5.4	3.5	3.8	3.3
	1984	5.5	6.5	4.8	5.6	6.6	4.9	4.4	5.2	3.8
	1985	5.3	6.3	4.7	5.4	6.2	4.7	5.1	6.5	4.2
	1986	5.5	6.2	5.0	5.5	6.1	5.1	4.6	6.1	3.4
U.S.	1970	8.4	9.5	7.5	8.4	9.6	7.5	8.2	9.1	7.5
	1971	8.1	9.2	7.1	8.1	9.3	7.3	7.8	8.3	7.3
	1972	8.2	9.3	7.4	8.1	9.2	7.3	8.4	9.6	7.4
	1973	7.9	8.9	7.2	7.9	8.9	7.2	7.7	8.5	7.1
	1974	7.5	8.5	6.8	7.5	8.6	6.8	7.3	8.2	6.5
	1975	6.5	7.4	5.8	6.5	7.4	5.9	6.1	7.0	5.3
	1976	6.3	7.2	5.7	6.4	7.3	5.7	5.7	6.3	5.2
	1977	6.1	7.0	5.4	6.1	7.1	5.4	5.6	6.5	5.0
	1978	5.9	6.8	5.2	5.9	6.8	5.3	5.5	6.3	4.9
	1979	5.7	6.5	5.0	5.6	6.5	5.0	5.6	6.3	5.1
	1980	5.7	6.6	5.0	5.6	6.5	5.0	5.9	6.8	5.2
	1981	5.2	6.0	4.6-	5.2	6.0	4.5	5.2	5.8	4.7
	1982	4.8	5.7	4.2	4.8	5.7	4.2	4.6	5.4	4.0
	1983	4.6	5.3	4.1	4.6	5.3	4.1	4.3	5.1	3.7
	1984	4.2	4.8	3.7	4.2	4.8	3.7	3.8	4.4	3.3
	1985	4.0	4.6	3.5	4.0	4.6	3.5	3.9	4.4	3.4
	1986*	3.6	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes).

[3] The introduction in 1979 of the 9th Revision of the International Classification of Diseases, WHO, for coding causes of death resulted in substantial changes in this category, making trend comparisons difficult. The estimated comparability ratio for this category is 1.0649. Note that comparability ratios were developed for comparing crude death rates, and they are not strictly applicable for comparing age-adjusted death rates. For further discussion of comparability ratios see Qualifications and Limitations of Data and Calculations.

* Provisional Data.

the Michigan rates declined more slowly than the national rates. Michigan's rates for other than white persons have been stable since 1971. The Michigan rates remained below the comparable rates for the nation from 1970 through 1983 but were higher in 1984 and 1985 (see Technical Notes). Rates for other than white persons were consistently lower than those for white persons in Michigan while these rates were roughly similar across the nation.

Nearly all atherosclerosis deaths are reported as generalized and/or unspecified as to type. Only 45 of the 1,214 deaths were in other classifications. Of these, 42 were attributed to atherosclerosis of arteries of the extremities (Table 2.43).

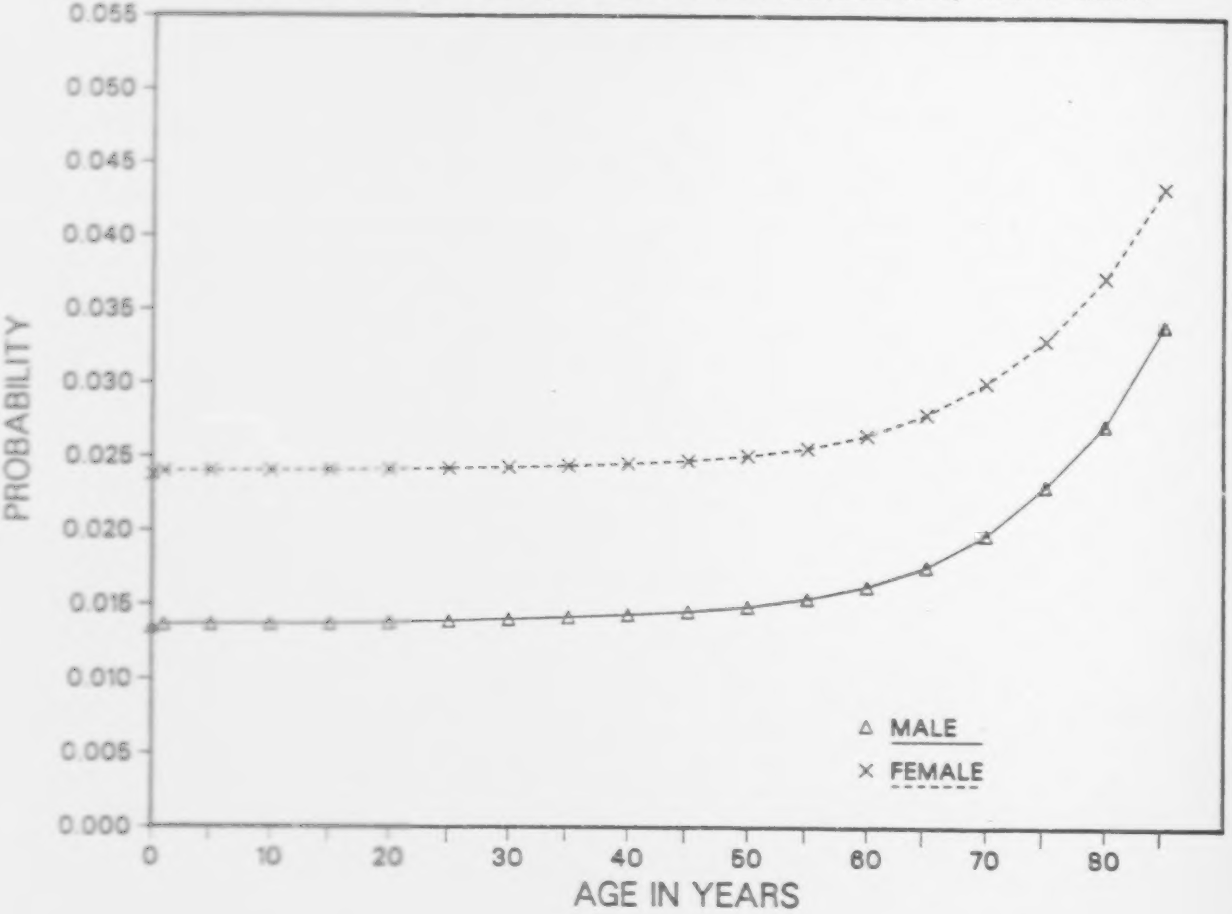
The 1984 through 1986 mortality data for Michigan indicate that females are more likely to eventually die from atherosclerosis than males. At birth, the likelihood for females is 0.024, while for males it is 0.013. These probabilities rise slowly through age 59 and increase rapidly beyond that age. By age 85, the probability of eventually dying from atherosclerosis is 0.043 for females and 0.034 for males (Figure 2.40).

TABLE 2.43
DEATHS DUE TO ATHEROSCLEROSIS BY DETAILED CAUSE, MICHIGAN RESIDENTS, 1986

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
440.9	Generalized and Unspecified Atherosclerosis	1,169	96.3
440.2	Atherosclerosis of Arteries of the Extremities	42	3.5
440.1	Atherosclerosis of Renal Artery	-	-
440.0	Atherosclerosis of Aorta	3	0.2
440.8	Atherosclerosis of Other Specified Arteries	-	-
	Total	1,214	100.0

[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.40
PROBABILITY OF EVENTUALLY DYING FROM ATHEROSCLEROSIS BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CHRONIC LIVER DISEASE AND CIRRHOSIS

The 9th leading cause of Michigan resident deaths in 1986 was chronic liver disease and cirrhosis. This category was termed cirrhosis of the liver prior to 1979. There were 1,120 deaths attributed to this category in 1986, of which 68.0 percent were to males.

The median age for deaths due to chronic liver disease and cirrhosis (59 years) was 14 years below that for deaths from all causes (Table 2.44). For deaths from this cause in 1986, the median age was 58 years for males and 62 years for females. The median ages at death for white males and females were 61 and 63 years, respectively. The median ages at death were 47 years for black males and 51 years for black females.

Death rates for chronic liver disease and cirrhosis by age, race, and sex are presented in Table 2.45. In 1986 the crude rate for males was 2.3 times the rate for females while the age-adjusted rate for males was 2.5 times that for females. Age-specific rates for males ranged from 1.9 to 3.6 times those for females (Figure 2.41). The highest rate for both sexes were for the age group 65-74 years.

The crude mortality rate for deaths due to chronic liver disease and cirrhosis for black persons was twice the rate for white persons. The age-adjusted rate for black persons was 2.8 times the rate for white persons. The differential can be traced mainly to the rates for ages 25 through 64. The highest age-specific rate for white persons was 42.5 deaths per 100,000 population in the age group 65-74 years. For black persons the peak rate (63.0) was observed for the age group 55-64 years (Figure 2.42).

Cirrhosis of the liver was the cause of death for 7.9 of every 100,000 Michigan residents in 1900. Death rates due to this cause rose to a peak of 13.1 in 1916, after which the relative frequency of cirrhosis deaths fell sharply, dropping to 7.4 in 1919. The Michigan rates held stable from this point until 1936 when they began increasing slowly. A peak of 12.4 was reached by 1948.

The statistics for Michigan shown in Figure 2.43 after 1949 are not comparable with preceding years due to a revision of the underlying cause of death determination. By isolating the period 1950-1986, this problem can be ignored. Michigan's mortality rate for this disease doubled between 1950 and 1972, when the highest rate of the century was recorded (19.7). The rate of 12.2 in 1986 was 38.1 percent less than the rate of 1972.

The cirrhosis of the liver mortality rate for the United States was well above Michigan's rate early in this century. The highest rate for the nation during the first half of the century occurred in 1907 (14.8). The rates for Michigan and the nation were similar from about 1916 through 1968. Between 1969 and 1972, rates for Michigan rose above those for the nation. The sharp drop in Michigan's rate since 1972 has brought the statistic for the state closer to the national figure. In 1986 the chronic liver disease and cirrhosis death rate of 12.2 for Michigan was 11.9 percent above the provisional rate of 10.9 for the nation.

Age-adjusted death rates by sex and race for chronic liver disease and cirrhosis for the years 1970-1986 are recorded in Table 2.46 (see Technical Notes). These rates generally

Table 2.44
Deaths Due to Chronic Liver Disease and Cirrhosis by Age, Race[1], and Sex Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	2	2	-	1	1	-	1	1	-	-	-	-
15-19	1	-	1	1	-	1	-	-	-	-	-	-
20-24	3	2	1	2	2	-	1	-	1	-	-	-
25-29	18	12	6	6	4	2	12	8	4	-	-	-
30-34	42	27	15	16	9	7	26	18	8	-	-	-
35-39	82	60	22	39	28	11	42	32	10	1	-	1
40-44	76	63	13	44	37	7	32	26	6	-	-	-
45-49	85	62	23	57	40	17	28	22	6	-	-	-
50-54	105	74	31	77	55	22	26	17	9	2	2	-
55-59	149	109	40	115	83	32	34	26	8	-	-	-
60-64	157	96	61	134	78	56	23	18	5	-	-	-
65-69	149	90	59	129	77	52	20	13	7	-	-	-
70-74	119	86	33	106	77	29	12	8	4	1	1	-
75-79	64	43	21	55	38	17	9	5	4	-	-	-
80-84	39	21	18	38	20	18	1	1	-	-	-	-
85-89	22	11	11	22	11	11	-	-	-	-	-	-
90+	7	4	3	7	4	3	-	-	-	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1,120	762	358	849	564	285	267	195	72	4	3	1
Median Age At Last Birthday	59	58	62	62	61	63	48	47	51	54	54	37

[1] Deaths with race not stated are included only in the total column.

Table 2.45

Death Rates for Deaths Due to Chronic Liver Disease and Cirrhosis, by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	12.2	17.1	7.6	10.9	14.8	7.2	21.8	33.8	11.1
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	*	*	*	*	*	*	*	*	*
25-34 Years	3.8	5.1	2.7	1.7	2.0	1.4	18.0	27.1	10.4
35-44 Years	12.8	20.3	5.6	7.8	12.3	3.3	49.8	87.2	19.5
45-54 Years	21.3	31.4	11.8	17.1	24.8	9.8	53.8	86.9	27.0
55-64 Years	36.9	51.8	23.2	33.9	45.8	23.0	63.0	105.9	26.5
65-74 Years	43.3	64.6	26.5	42.5	63.2	26.2	51.4	77.4	31.3
75-84 Years	32.7	53.9	19.9	32.6	54.3	19.6	35.5	53.7	*
85 Years and Over	27.9	49.2	19.1	30.6	54.3	20.8	*	*	*
Age-Adjusted Rate[2]	10.7	15.8	6.2	8.9	12.8	5.4	24.5	40.1	11.8

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

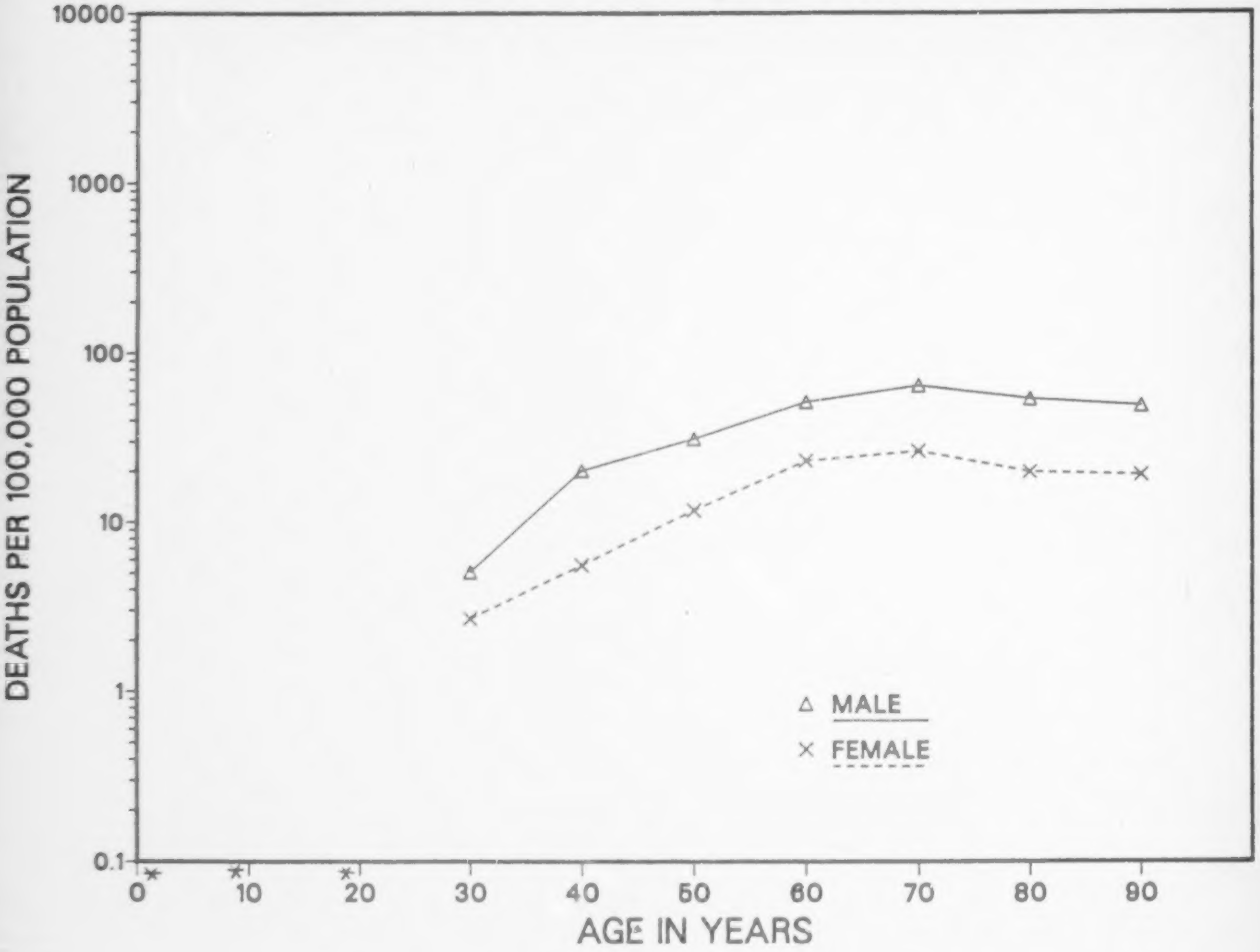
[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.41

AGE-SPECIFIC CHRONIC LIVER DISEASE AND CIRRHOSIS DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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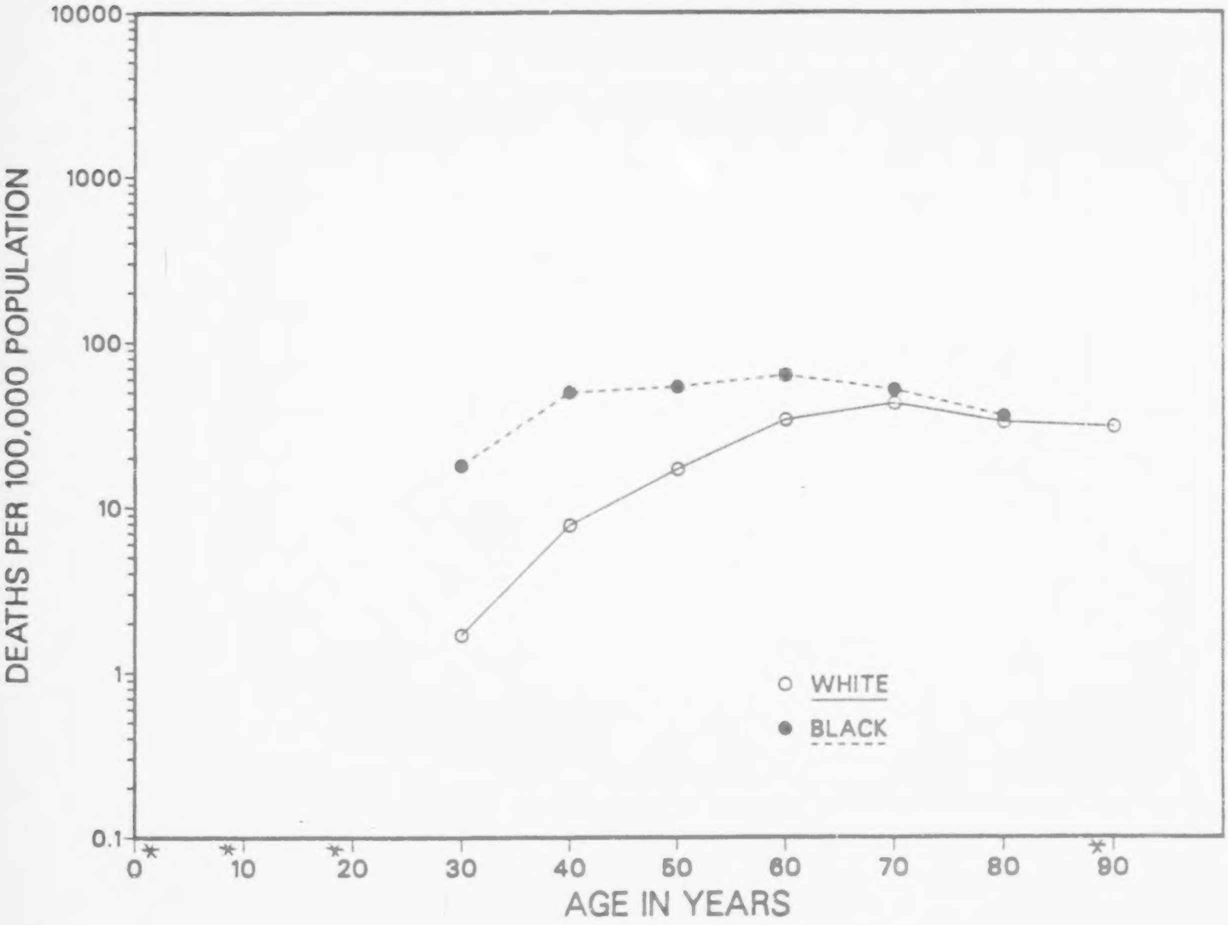
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.42
AGE-SPECIFIC CHRONIC LIVER DISEASE AND CIRRHOSIS DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1986

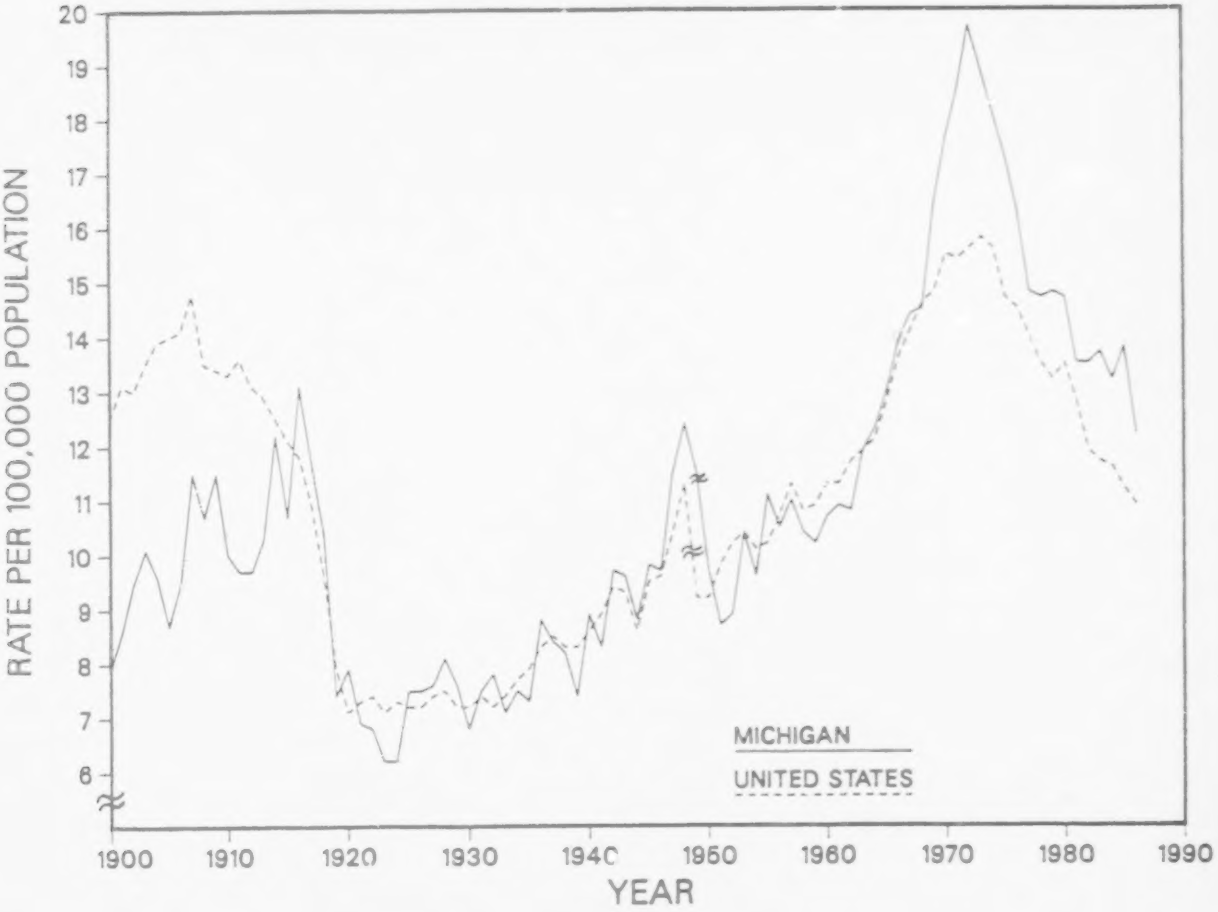


[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.43

CHRONIC LIVER DISEASE AND CIRRHOSIS[1] DEATH RATES, MICHIGAN AND UNITED STATES[2] RESIDENTS, 1900-1986[3]



[1] Prior to 1979 termed Cirrhosis of Liver.

[2] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[3] The comparability of cirrhosis of the liver death rates from the 5th revisions of the ICDA coding procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be .80. The 6th revision was adopted in 1949 for national cause-of-death statistics and in 1950 for Michigan statistics. The comparability of cirrhosis of the liver death rates through the 6th, 7th, 8th, and 9th revisions (1949 to date nationally and 1950 to date in Michigan) is high. General comparison before and after these dates of adoption can be made but detailed study requires special consideration.
See Technical Notes.

Table 2.46
Age-Adjusted Death Rates[1] for Deaths Due to Chronic Liver Disease and Cirrhosis by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich	1970	17.7	24.9	11.2	15.6	22.0	9.7	34.8	48.3	22.5
	1971	18.7	25.6	12.3	16.2	22.2	10.7	37.7	53.3	23.7
	1972	19.8	27.8	12.5	17.0	24.4	10.3	41.2	54.9	28.8
	1973	18.8	26.7	11.7	16.3	23.2	10.1	37.9	54.2	23.4
	1974	17.9	25.8	10.8	14.7	21.5	8.7	41.8	59.7	25.9
	1975	17.1	23.9	11.1	14.4	20.2	9.2	37.5	52.1	24.6
	1976	15.9	23.0	9.6	13.6	19.8	8.0	32.9	47.2	20.4
	1977	14.5	20.6	9.1	12.1	17.6	7.2	31.7	42.9	22.0
	1978	14.2	19.6	9.3	12.0	16.9	7.8	29.6	40.9	20.0
	1979	14.2	21.1	8.2	11.4	17.1	6.4	34.1	50.4	20.1
	1980	14.1	19.7	9.1	11.6	16.5	7.3	31.1	43.7	20.5
	1981	12.7	17.9	8.2	10.9	15.6	6.7	25.0	34.1	17.5
	1982	12.4	17.5	8.0	10.6	15.2	6.6	24.9	34.2	17.2
	1983	12.5	18.6	7.2	10.6	15.6	6.1	25.0	39.5	13.3
	1984	11.8	16.6	7.7	9.9	14.0	6.3	25.1	35.8	16.2
	1985	12.3	17.5	7.6	9.9	14.0	6.3	28.4	43.3	16.1
	1986	10.7	15.8	6.2	8.9	12.8	5.4	22.7	37.0	11.0
U.S	1970	14.7	20.2	9.5	13.4	18.8	8.7	23.8	31.3	17.4
	1971	14.6	20.2	9.7	13.5	18.9	8.7	23.4	31.0	16.9
	1972	14.9	20.8	9.6	13.5	19.0	8.5	25.3	35.0	17.1
	1973	15.0	20.8	9.8	13.6	19.3	8.7	25.1	33.7	17.9
	1974	14.7	20.6	9.6	13.4	19.0	8.5	24.8	33.9	17.2
	1975	13.7	19.4	8.8	12.5	17.8	7.9	22.9	32.0	15.3
	1976	13.5	19.0	8.6	12.2	17.4	7.7	22.9	32.1	15.1
	1977	13.0	18.3	8.3	11.7	16.6	7.4	22.2	31.2	14.7
	1978	12.4	17.5	8.0	11.2	16.0	7.1	20.7	29.0	13.9
	1979	12.0	17.0	7.7	11.0	15.6	7.0	19.7	28.2	12.8
	1980	12.2	17.1	7.9	11.0	15.7	7.0	20.0	28.1	13.5
	1981	11.4	16.0	7.4	10.5	14.8	6.7	17.6	24.7	11.9
	1982	10.5	14.9	6.7	9.8	14.1	6.1	14.9	20.9	10.1
	1983	10.2	14.3	6.6	9.5	13.4	6.0	14.7	20.5	10.0
	1984	10.0	14.1	6.1	9.3	13.2	5.9	14.3	20.2	9.5
	1985	9.6	13.6	6.1	8.9	12.6	5.6	14.4	20.7	9.3
	1986[3]	9.2	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates (see Technical Notes).

[3] Provisional Data.

peaked about 1972 in Michigan and have tended to decline since then. For the United States the increases observed in the early part of the decade were less pronounced, as were the declines after that time.

The age-adjusted rates in Michigan for other than white males have been higher than for all other groups, including the rates for other than white males observed nationally. The rates for other than white females in Michigan have also been higher than the comparable rates for the nation.

Age-adjusted death rates for chronic liver disease and cirrhosis for white males in Michigan were higher than rates for white males nationally throughout the sixteen year period. Rates for white females in Michigan were higher than for their counterparts in the nation at the beginning of the 1970's. In recent years the rates for the two groups have been similar. In 1986 the age-adjusted rate for the total Michigan population was 16.3 percent above the provisional rate for the United States.

Cirrhosis of the liver without mention of alcohol was the most frequently reported cause of deaths due to chronic liver disease and cirrhosis in 1986, resulting in 568 deaths (Table 2.47). The second largest category was alcoholic cirrhosis of the liver with 314 deaths.

Table 2.47

Deaths Due to Chronic Liver Disease and Cirrhosis by Detailed Cause, Michigan Residents, 1986

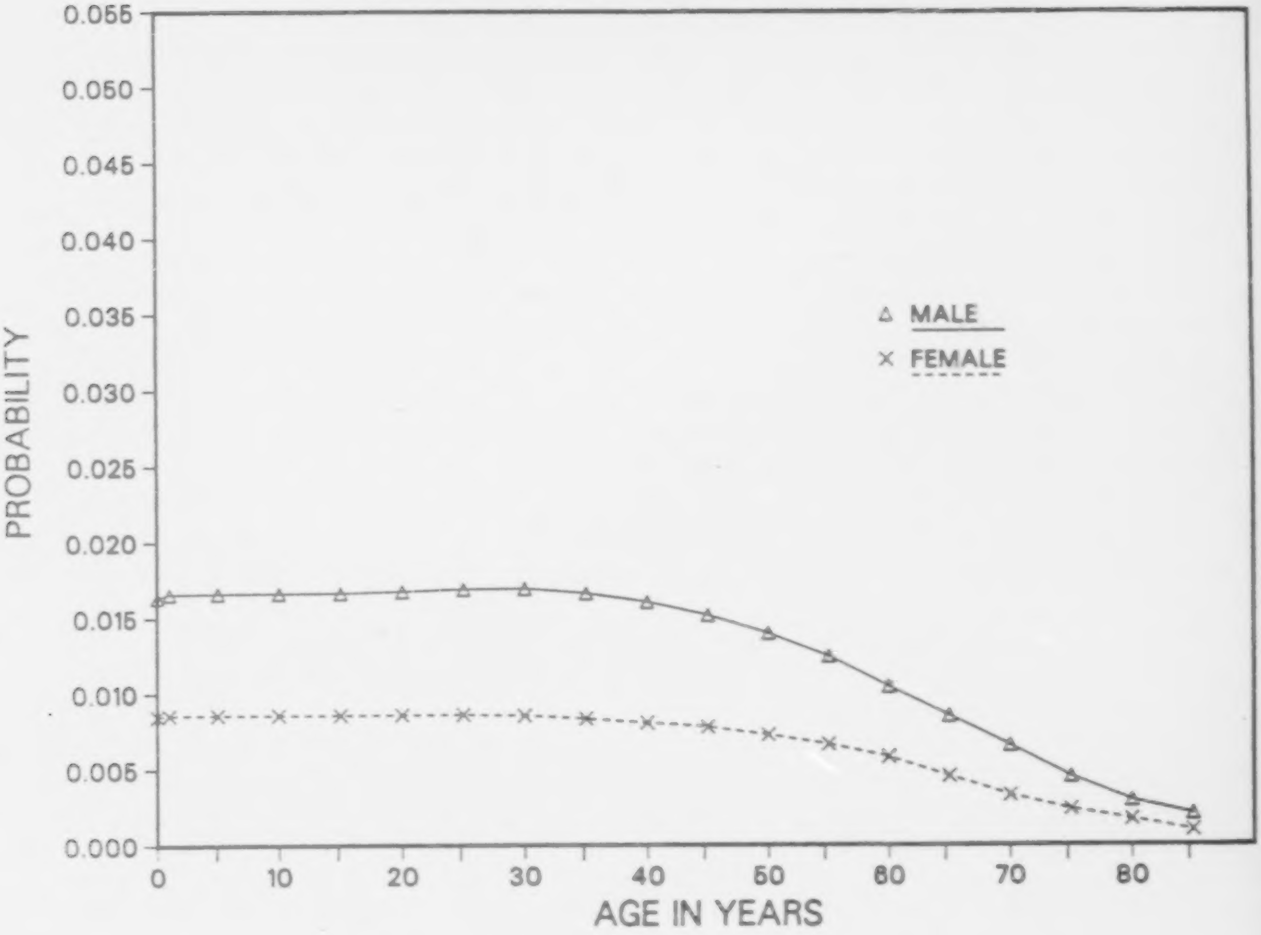
ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
571.5	Cirrhosis of Liver Without Mention of Alcohol	568	50.7
571.2	Alcoholic Cirrhosis of Liver	314	28.0
571.0	Alcoholic Fatty Liver	92	8.2
571.3	Alcoholic Liver Damage, Unspecified	58	5.2
571.4	Chronic Hepatitis	31	2.8
571.1	Acute Alcoholic Hepatitis	22	2.0
571.8	Other Chronic Nonalcoholic Liver Disease	13	1.2
571.6	Biliary Cirrhosis	13	1.2
571.9	Unspecified Chronic Liver Disease Without Mention of Alcohol	9	0.8
	Total	1,120	100.0

[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

There were 66 deaths attributed to other chronic nonalcoholic liver disease. Including deaths due to alcoholic cirrhosis of the liver, alcoholic fatty liver, acute alcoholic hepatitis, and unspecified alcoholic liver damage, there were 486 deaths with mention of alcohol attributed to the category of chronic liver disease and cirrhosis.

The probability of eventually dying from chronic liver disease and cirrhosis, based upon Michigan mortality data from the years 1984-1986, is displayed in Figure 2.44 by age and sex. This graph reveals that the risk for males of dying from a disease in this category is roughly double that for females. At birth, males have a probability of 0.016 of eventually dying from chronic liver disease and cirrhosis. For females the probability is 0.009. These probabilities remain nearly constant for both sexes through age 39, whereupon the threat of death due to these diseases diminishes with advancing age. By age 85 the risk is 0.002 for males and 0.001 for females.

FIGURE 2.44
PROBABILITY OF EVENTUALLY DYING FROM
CHRONIC LIVER DISEASE AND CIRRHOSIS
BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

SUICIDE

There were a total of 1,119 suicide deaths in 1986, making suicide the 10th leading cause of death. Of the deaths resulting from suicide 77.0 percent were among males. Of all suicide deaths 89.8 percent were to white persons.

More than fifty percent of all suicide deaths occurred at or below the age of 39. The median age at death for males was 37 years, 8 years below that for females. The median ages at death for white males and females were 38 and 45 years, respectively. For black males and females the median ages at death were 33 and 41 years, respectively. Among white persons, 199 suicide deaths (19.8 percent) were among persons 65 years of age or older. Among black persons there were nine suicide deaths at age 65 or over or 8.3 percent of the total (Table 2.48).

The crude suicide death rate in 1986 was 12.2 per 100,000 population. The crude rate for males (19.4) was 3.5 times that for females (5.5). Age-specific rates for males were higher than female rates in all age groups (Table 2.49 and Figure 2.45). While suicide rates for males were highest among men aged 75 or older, the rates for females were highest among women 45 to 54. The greatest relative differentials by sex were for the ages 75 and over where the rates for males were over seven times that of females, and for ages less than 35 where the rates for males were over five times that of females.

The crude suicide death rate for the white population was 44.9 percent higher than that for the black population. The age-adjusted rate for white persons was 26.6 percent higher than that for black persons. Age-specific rates by race from Table 2.49 are displayed in Figure 2.46. Age-specific rates for white persons were greater than those for black persons in all categories with sufficient events to calculate rates.

There is strong similarity in both the trend and magnitude of suicide death rates for Michigan and the United States in this century (Figure 2.47). There were two complete cycles of rising then falling rates in the period 1900 through 1944. The rates then held fairly stable for about 20 years. Between 1964 and 1977 the suicide death rate increased by 38.6 percent in Michigan, reaching 14.0, the highest rate since 1938. The highest rate during this century for Michigan was 18.8 in 1931, while the lowest was the rate of 8.8 in 1900. For the nation high and low rates were observed in 1932 (17.4) and in 1957 (9.8). In 1986 the provisional rate for the United States was 13.1, 7.4 percent above the Michigan rate of 12.2.

Age-adjusted suicide death rates by race and sex for Michigan and the United States are presented in Table 2.50. For white females in Michigan the age-adjusted rates for suicide remained quite stable from 1970 through 1977, and have since declined, while those for white males increased between 1970 and 1977, and held below that level through 1986. The rates for other than white persons rose between 1970 and 1979 and have remained below the 1979 level through 1986. The rates for other than white persons were consistently less than those of their white counterparts during the seventeen year period.

Age-adjusted suicide death rates for the nation were more stable. For white and other than white females the rates are slowly declin-

Table 2.48
Deaths Due to Suicide by Age, Race[1], and Sex
Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	5	4	1	4	3	1	1	1	-	-	-	-
15-19	88	71	17	76	62	14	12	9	3	-	-	-
20-24	106	93	13	97	85	12	9	8	1	-	-	-
25-29	143	127	16	123	109	14	20	18	2	-	-	-
30-34	121	96	25	108	86	22	11	8	3	2	2	-
35-39	102	79	23	86	66	20	16	13	3	-	-	-
40-44	80	48	32	74	44	30	5	4	1	1	-	1
45-49	80	45	35	72	41	31	7	4	3	1	-	1
50-54	54	38	16	46	33	13	7	5	2	1	-	1
55-59	72	51	21	65	48	17	7	3	4	-	-	-
60-64	60	44	16	55	41	14	5	3	2	-	-	-
65-69	52	35	17	49	33	16	3	2	1	-	-	-
70-74	51	43	8	48	40	8	3	3	-	-	-	-
75-79	44	35	9	43	34	9	1	1	-	-	-	-
80-84	41	35	6	40	34	6	1	1	-	-	-	-
85-89	13	12	1	12	11	1	1	1	-	-	-	-
90+	7	6	1	7	6	1	-	-	-	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1,119	862	257	1,005	776	229	109	84	25	5	2	3
Median Age At Last Birthday	39	37	45	40	38	45	35	33	41	43	34	45

[1] Deaths with race not stated are included only in the total column.

Table 2.49
Suicide Death Rates by Age, Race, and Sex[1], Michigan Residents, 1986

AGE	ALL RACES			WHITE			BLACK		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	12.2	19.4	5.5	12.9	20.3	5.7	8.9	14.5	3.8
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	0.3	*	*	*	*	*	*	*	*
15-24 Years	12.7	21.4	4.0	13.6	22.9	4.1	9.0	14.9	*
25-34 Years	16.9	28.9	5.2	17.4	29.3	5.4	14.6	27.1	4.3
35-44 Years	14.7	21.0	8.7	15.0	20.8	9.3	14.1	25.6	*
45-54 Years	15.0	19.1	11.1	15.1	19.3	11.0	13.9	20.1	9.0
55-64 Years	15.9	24.0	8.5	16.3	25.3	8.1	13.3	14.4	12.2
65-74 Years	16.6	28.6	7.2	17.5	29.9	7.7	9.6	18.4	*
75-84 Years	27.0	59.0	7.6	29.1	63.7	8.4	*	*	*
85 Years and Over	19.3	59.0	*	20.0	61.6	*	*	*	*
Age-Adjusted Rate[2]	11.5	18.3	5.3	11.9	18.9	5.4	9.4	15.6	4.2

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

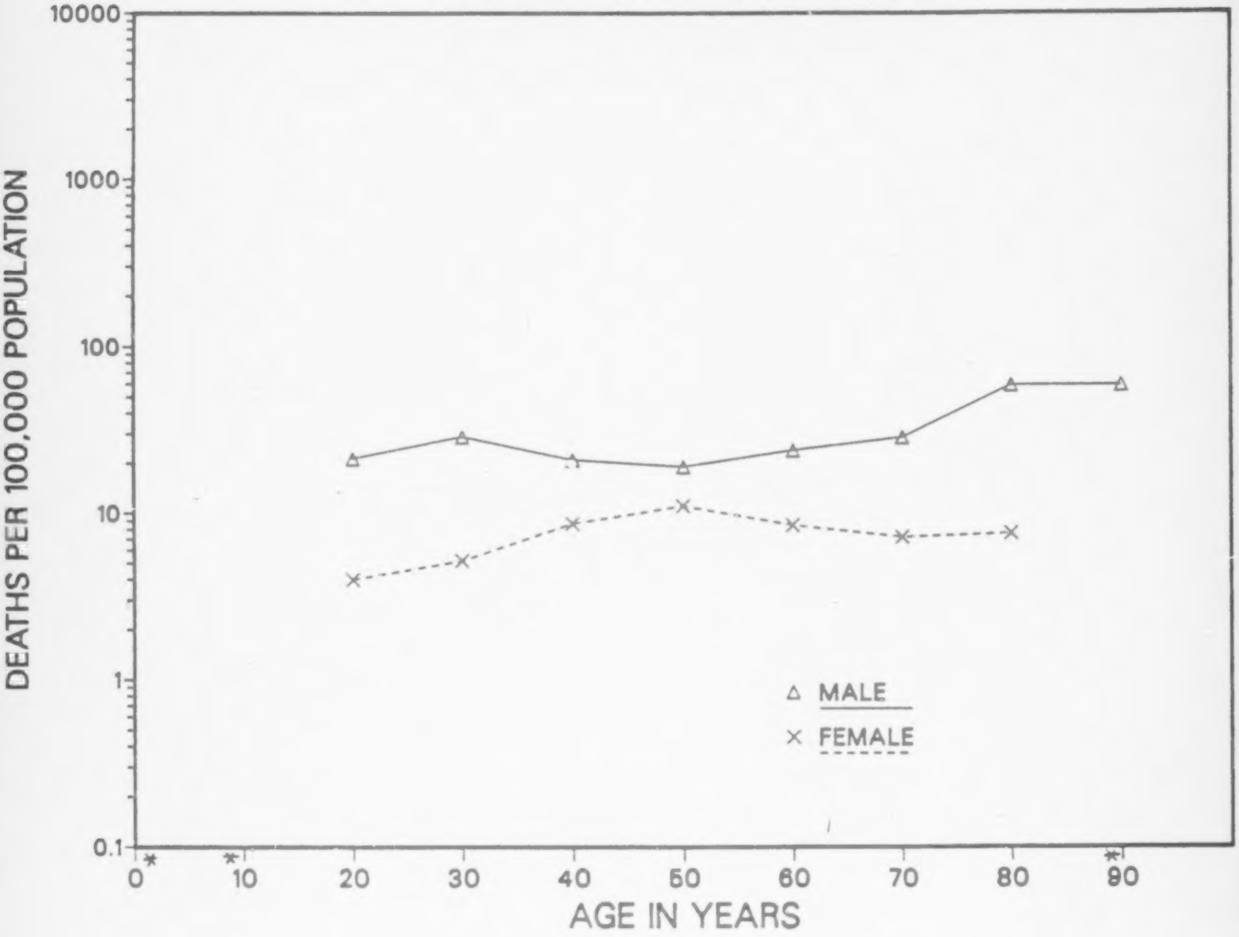
[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

*Rate is considered statistically unreliable.

Note: Population estimates by race used to compute the rates in this table are from a revised series of population estimates based on a modified race distribution for 1980. The race distribution was modified to be consistent with the racial categories from the 1970 census and the categories used by state Departments of Health. This modified race distribution is inconsistent with official, published data.

FIGURE 2.45

AGE-SPECIFIC SUICIDE DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1986



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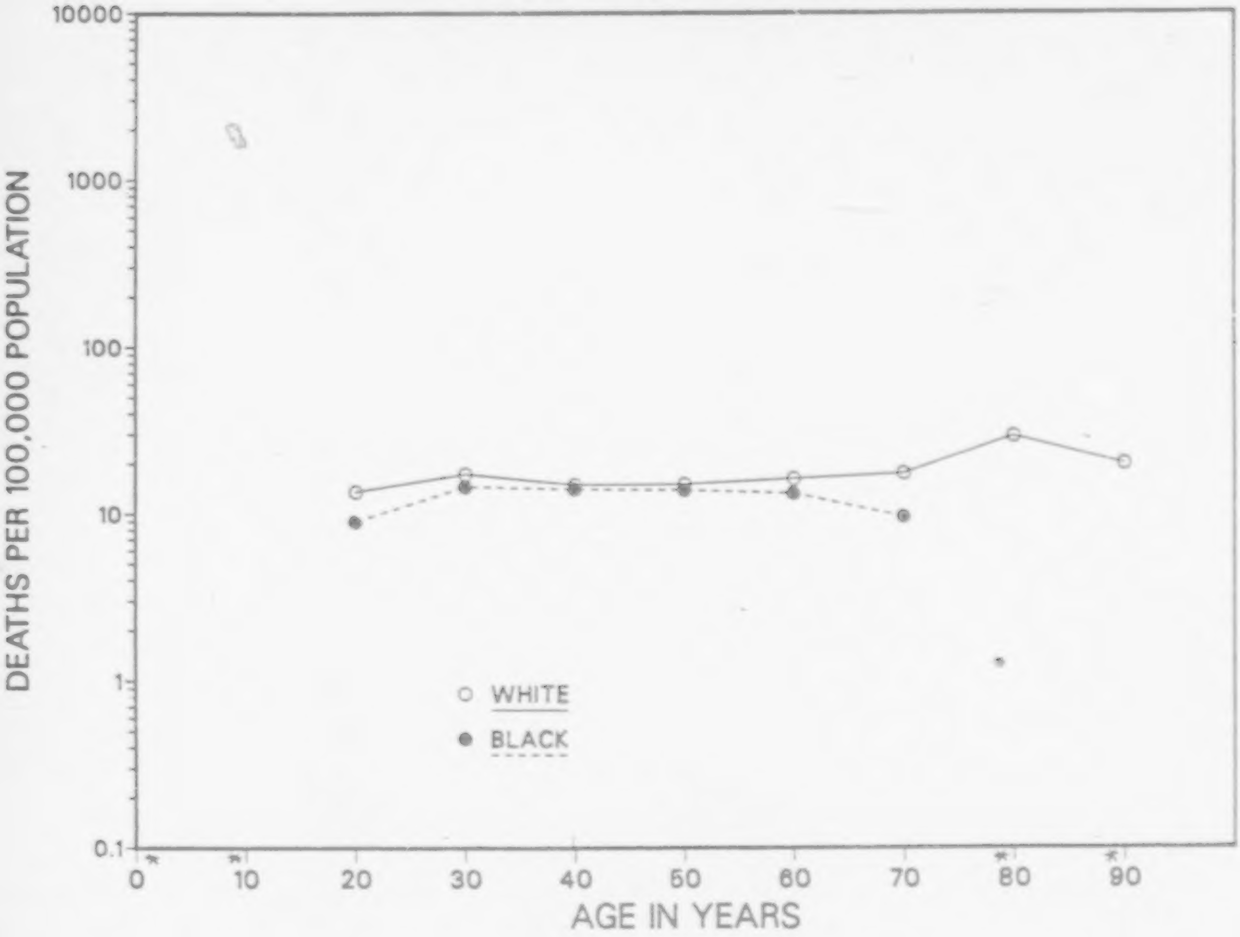
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.46
AGE-SPECIFIC SUICIDE DEATH RATES[1] BY RACE,
MICHIGAN RESIDENTS, 1986



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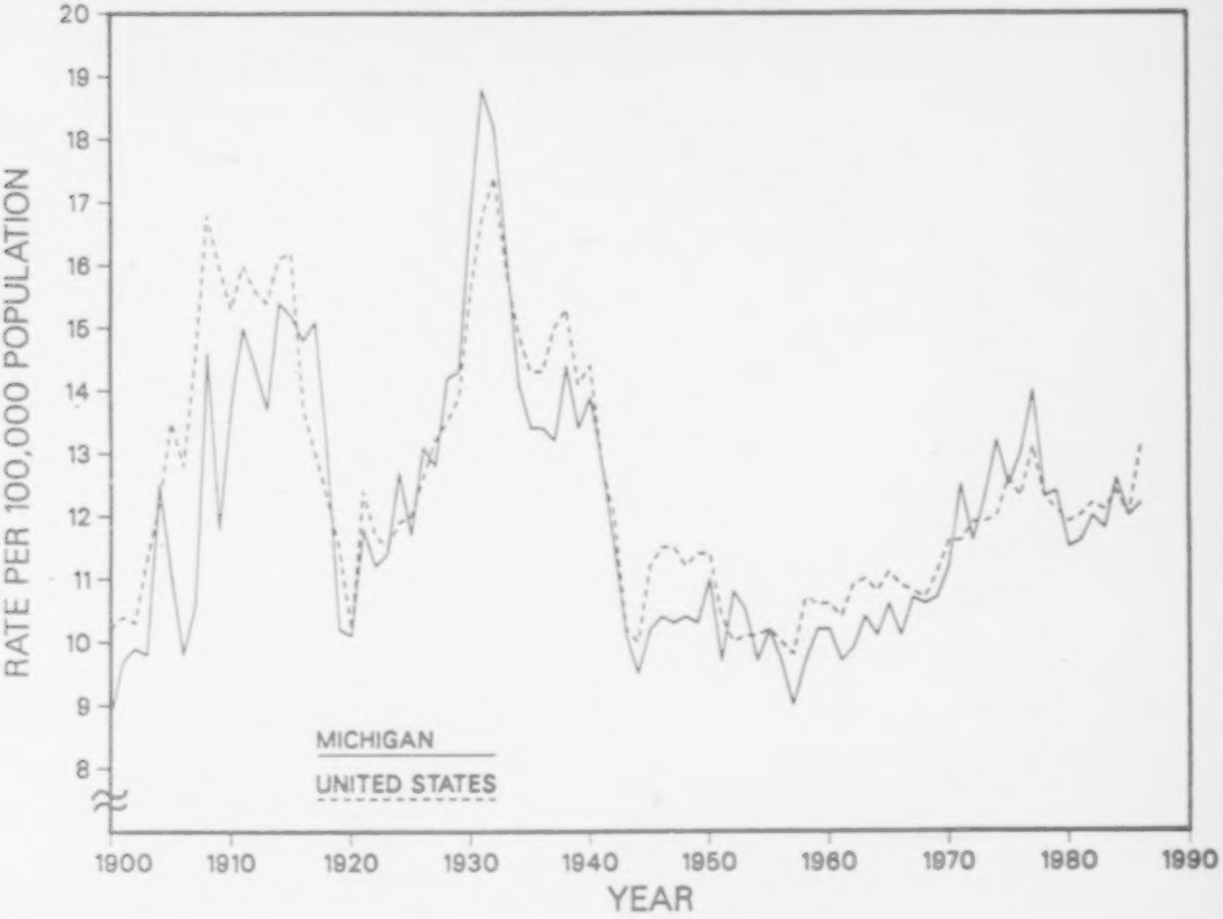
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.47
SUICIDE DEATH RATES, MICHIGAN AND UNITED STATES[1] RESIDENTS, 1900-1986[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1986. United States rates for 1971-1979 have been revised using population estimates based on the 1980 Census enumeration. United States rate for 1986 is provisional.

[2] Suicide death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.50
Age-Adjusted Suicide Death Rates[1] by Race and Sex, Michigan[2] and United States Residents, 1970-1986

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich	1970	11.9	17.3	6.9	12.4	17.9	7.3	7.4	11.8	3.4
	1971	13.0	18.2	8.4	13.2	18.4	8.6	10.7	16.0	6.1
	1972	12.1	17.9	6.9	12.6	18.4	7.2	8.3	12.9	4.3
	1973	12.8	19.3	6.7	13.2	19.8	7.0	9.6	15.8	4.2
	1974	13.6	19.9	8.0	14.2	20.6	8.3	9.2	13.8	5.3
	1975	12.9	19.4	6.8	13.2	19.8	7.1	9.8	15.7	4.7
	1976	13.2	19.8	7.0	13.5	20.2	7.2	10.6	16.7	5.3
	1977	13.9	21.4	7.1	14.4	22.0	7.4	10.0	16.2	4.7
	1978	12.2	18.8	6.2	12.5	19.2	6.2	10.2	15.5	5.8
	1979	12.2	18.6	6.3	12.3	18.7	6.4	11.4	18.0	5.6
	1980	11.2	17.7	5.2	11.7	18.2	5.6	7.9	13.7	2.9
	1981	11.6	17.9	5.9	12.3	18.6	6.4	7.2	13.0	2.3
	1982	11.9	18.9	5.5	12.6	19.8	5.9	7.4	12.8	2.7
	1983	11.9	19.1	5.3	12.5	19.6	5.7	8.6	15.9	2.6
	1984	12.1	19.0	5.9	12.8	20.0	6.1	8.2	12.7	4.4
	1985	11.5	19.5	4.1	11.9	19.9	4.4	8.7	16.5	2.1
	1986	11.5	18.3	5.3	11.9	18.9	5.4	9.0	14.5	4.4
U.S.	1970	11.8	17.3	6.8	12.4	18.2	7.2	6.5	10.3	3.3
	1971	11.8	17.2	7.0	12.4	18.0	7.4	6.7	10.1	3.8
	1972	12.1	17.8	6.9	12.6	18.4	7.3	7.4	11.8	3.6
	1973	11.9	17.8	6.6	12.5	18.6	7.0	7.1	11.5	3.3
	1974	12.1	18.1	6.5	12.7	18.9	7.0	7.1	11.6	3.2
	1975	12.5	18.8	6.8	13.2	19.6	7.3	7.4	11.9	3.5
	1976	12.1	18.3	6.5	12.7	19.0	7.0	7.4	12.1	3.4
	1977	12.8	19.4	6.7	13.5	20.3	7.1	7.6	12.2	3.6
	1978	11.9	18.2	6.1	12.5	19.0	6.6	7.2	11.9	3.2
	1979	11.7	17.9	5.9	12.2	18.6	6.3	7.7	12.7	3.3
	1980	11.4	18.0	5.4	12.1	18.9	5.7	6.7	11.3	2.8
	1981	11.5	18.0	5.7	12.2	18.9	6.0	6.8	11.2	3.0
	1982	11.6	18.3	5.4	12.4	19.4	5.8	6.4	10.8	2.6
	1983	11.4	18.2	5.2	12.2	19.3	5.6	6.4	10.7	2.6
	1984	11.6	18.7	5.3	12.4	19.7	5.6	6.6	11.2	2.7
	1985	11.5	18.8	4.9	12.3	19.9	5.3	6.7	11.3	2.5
	1986[3]	12.0	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Michigan rates for 1981-1985 have been revised based upon revisions to population estimates. (see Technical Notes)

[3] Provisional Data.

ing. The rate for white males peaked in 1977 and have been below that level since that year. The rate for other than white males increased by 23.3 percent between 1970 and 1979. Since 1979 the national rate for other than white males has decreased by 11.0 percent.

The age-adjusted suicide death rates in Michigan for the other than white population were significantly higher than those of the nation. Rates in Michigan for the white population groups were similar to those of the nation. The age-adjusted rate for the total population of Michigan was at or above the comparable national rate fifteen out of seventeen years from 1970 through 1986.

Suicides in Michigan were predominantly the result of one of four types of self-inflicted injury. Self-inflicted injury by firearms caused 604 deaths in 1986. Self-inflicted poisoning by gases and vapors resulted in 175 deaths. Hanging, strangulation and suffocation resulted in 168 deaths. There were 100 deaths due to poisoning by drugs, medicaments and biologicals. Together these four types of suicide accounted for 93.5 percent of all suicide deaths to Michigan residents in 1986 (Table 2.51).

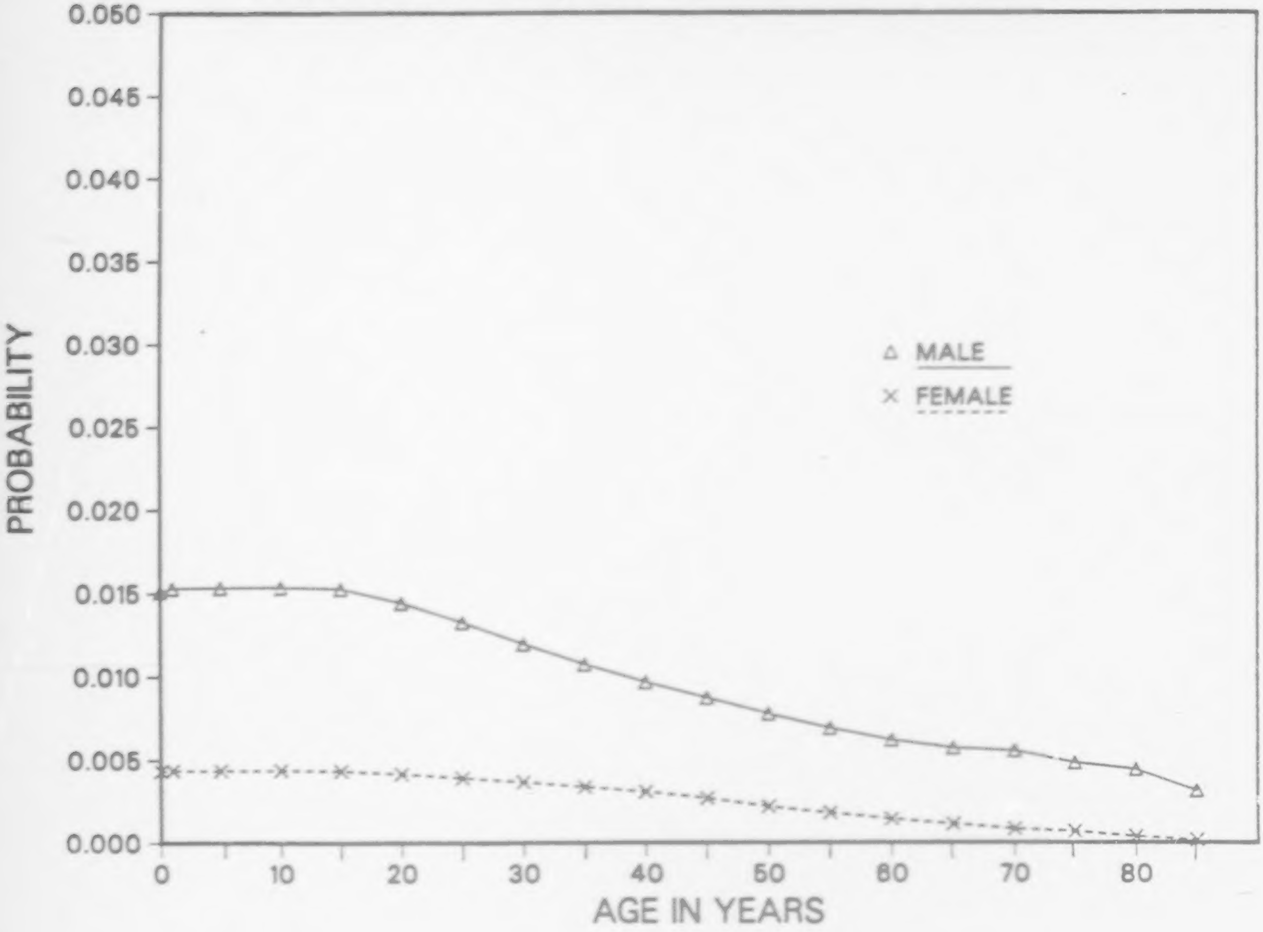
Using the Michigan mortality experience of 1984 through 1986, the chance of a male eventually dying from suicide is 0.015 at birth. The risk for females is 0.004. These probabilities hold relatively constant up to age 20 then taper slowly with advancing age (Figure 2.48).

Table 2.51
Deaths Due to Suicide by Method
Michigan Residents, 1986

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
269	Suicide by All Other and Unspecified Firearms	587	52.5
266	Suicide by Gases and Vapors	175	15.6
267	Suicide by Hanging, Strangulation and Suffocation	168	15.0
264	Suicide by Drugs, Medicaments,and Biologicals	100	8.9
270	Suicide by All Other Means and Late Effects of Self - Inflicted Injury	66	5.9
268	Suicide by Handguns	17	1.5
265	Suicide by Other Solid or Liquid Substances	6	0.5
	Total	1,119	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.48
PROBABILITY OF EVENTUALLY DYING FROM SUICIDE BY AGE AND SEX, MICHIGAN RESIDENTS, 1984-1986[1]



[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

THE PROBABILITY OF EVENTUAL DEATH DUE TO A SPECIFIED CAUSE

While cause-specific death rates are useful in gauging the frequency of death due to certain causes and in making comparisons between areas or populations, they do not relate the risk that the condition imposes on the population with clarity. Mortality data can be used to develop this risk in probabilistic terms. Through the application of life expectancy techniques, a probability of death due to a given cause can be estimated.

Such probabilities represent the average risk of eventual death being caused by a specified condition under an assumption that the mortality across all ages that was observed in a time period will remain unchanged through the remaining life of the population. These probabilities can be estimated for any given age attained. The following table relates the probability at birth of dying from the ten leading causes of death based upon Michigan mortality experience for the years 1984 through 1986.

The 1984 through 1986 data would indicate that 85.8 percent of all males and 86.2 percent of all females in Michigan will die from one of the ten leading causes if all things remain constant. Approximately four of every ten people will die from heart disease. Women

DISEASE CATEGORY	PROBABILITY AT BIRTH OF EVENTUAL DEATH DUE TO CONDITION FOR:	
	Males	Females
Diseases of the Heart	.404	.434
Malignant Neoplasms	.222	.191
Cerebrovascular Diseases	.060	.097
Accidents and Adverse Effects	.037	.021
Chronic Obstructive Pulmonary Diseases and Allied Conditions	.045	.025
Pneumonia and Influenza	.031	.035
Diabetes Mellitus	.015	.022
Atherosclerosis	.013	.024
Chronic Liver Disease and Cirrhosis	.016	.009
Suicide	.015	.004
All Other Causes	.142	.138
Total	1.000	1.000

face higher risks of death from heart disease, cerebrovascular disease, pneumonia and influenza, diabetes mellitus, and atherosclerosis than do males. At the same time, males are more likely to die from cancer, accidents, chronic obstructive pulmonary diseases and allied conditions, chronic liver disease and cirrhosis, and suicide.

Related to the probability at birth of eventual death due to a given cause is the hypothetical gain in life expectancy that would result if a given cause of death were eliminated. Based on 1984-1986 mortality data, the average number of years of life gained by eliminating deaths due to a major cause is given in the table that follows. Deaths in infancy from all causes are added for comparative purposes.

The largest gains in life expectancy would result from the elimination of heart disease and cancer, the two leading causes of death. Considering the number of deaths involved, relatively large gains in life expectancy would result from the elimination of infant mortality, accidents, and suicide. Eliminating deaths in the younger age groups, where many of the deaths from these causes occur, has a greater impact on the potential number of years of life to be gained than eliminating deaths in the older age groups.

DISEASE CATEGORY ELIMINATED	YEARS GAINED IN LIFE EXPECTANCY FOR:	
	Males	Females
Diseases of the Heart	4.57	3.33
Malignant Neoplasms	2.88	2.89
Cerebrovascular Diseases	0.49	0.63
Accidents and Adverse Effects	1.12	0.51
Chronic Obstructive Pulmonary Diseases and Allied Conditions	0.39	0.28
Pneumonia and Influenza	0.22	0.19
Diabetes Mellitus	0.17	0.23
Atherosclerosis	0.06	0.07
Chronic Liver Disease and Cirrhosis	0.31	0.18
Suicide	0.43	0.14
All Causes of Infant Mortality	0.92	0.76

INFANT DEATHS

Of the 80,177 deaths occurring to Michigan residents in 1986, 1,565 occurred to individuals less than one year of age. The number of infant deaths declined steadily each year from 1958 through 1986, with the exception of two years when it rose, 1970 and 1984 and one year when the number held steady, 1981. Since 1970, when there were 3,492 such deaths, the frequency of infant deaths has declined by 55.2 percent (Table 2.52). Nationally, the provisional number of infant deaths in 1986 was 38,600. This was 48.3 percent below the number in 1970.

The rate of death for infants under the age of one year has dropped considerably since 1900. In that year there were 157.1 infant deaths for every 1,000 live births. This means that about

Table 2.52
Infant Deaths and Infant Mortality Rates,
Michigan and United States[1] Residents, 1970 - 1986

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
74,667	20.0	1970	3,492	20.3
67,981	19.1	1971	3,157	19.5
60,182	18.5	1972	2,801	19.1
55,581	17.7	1973	2,561	18.1
52,776	16.7	1974	2,387	17.4
50,525	16.1	1975	2,205	16.5
48,265	15.2	1976	1,978	15.1
46,975	14.1	1977	1,945	14.1
45,945	13.8	1978	1,931	13.9
45,665	13.1	1979	1,921	13.3
45,526	12.6	1980	1,851	12.8
43,305	11.9	1981	1,851	13.2
42,401	11.5	1982	1,672	12.1
40,627	11.2	1983	1,573	11.8
39,580	10.8	1984	1,595	11.7
40,030	10.6	1985	1,575	11.4
38,600	10.4	1986	1,565	11.4

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[1] United States data for 1986 are provisional.

16 of every 100 infants did not survive their first year. This rate fell below 100 by 1914 (96.8), to less than 70 by 1927 (67.7), and to less than 50 by 1935 (47.7). During the 1940's the Michigan infant death rate declined from 40.6 in 1940 to 28.9 in 1949.

Relative declines in the infant death rate slowed considerably in the 1950's and 1960's. It was not until 1971 that the rate dropped below 20 to 19.5. The rate of decline between 1970 and 1980 compares favorably with the rate of decline observed before 1950. The infant death rate for Michigan rose in 1981 for the first such increase since 1970. This rate then declined each year between 1982 and 1985. In 1986, the Michigan infant mortality rate was 11.4, the same as the 1985 rate (Figure 2.49).

During the period 1915-1928, the rate for Michigan was above that for the United States 9 of 14 years. From 1929 through 1969, Michigan's infant death rate was consistently below the national statistic. From 1970 through 1975 the infant mortality rate in Michigan was slightly higher than the rate for the nation. From 1976 through 1980 the rates for the state and nation were similar. Since 1980 the rate for Michigan has been 5 to 11 percent above the national rate. The provisional rate for the United States in 1986 was 10.4.

Table 2.53 shows the numbers of infant deaths and infant death rates by age at death for the period 1976-1986. The number of infants that died during the first day of life in 1986 (680) is greater than the number of deaths of infants aged 7-364 days (648). In 1986 68.9 percent of all infant deaths occurred within the first four weeks of life and 58.6 percent occurred in the first week. These percentages were 72.0 and 62.2 percent in 1976.

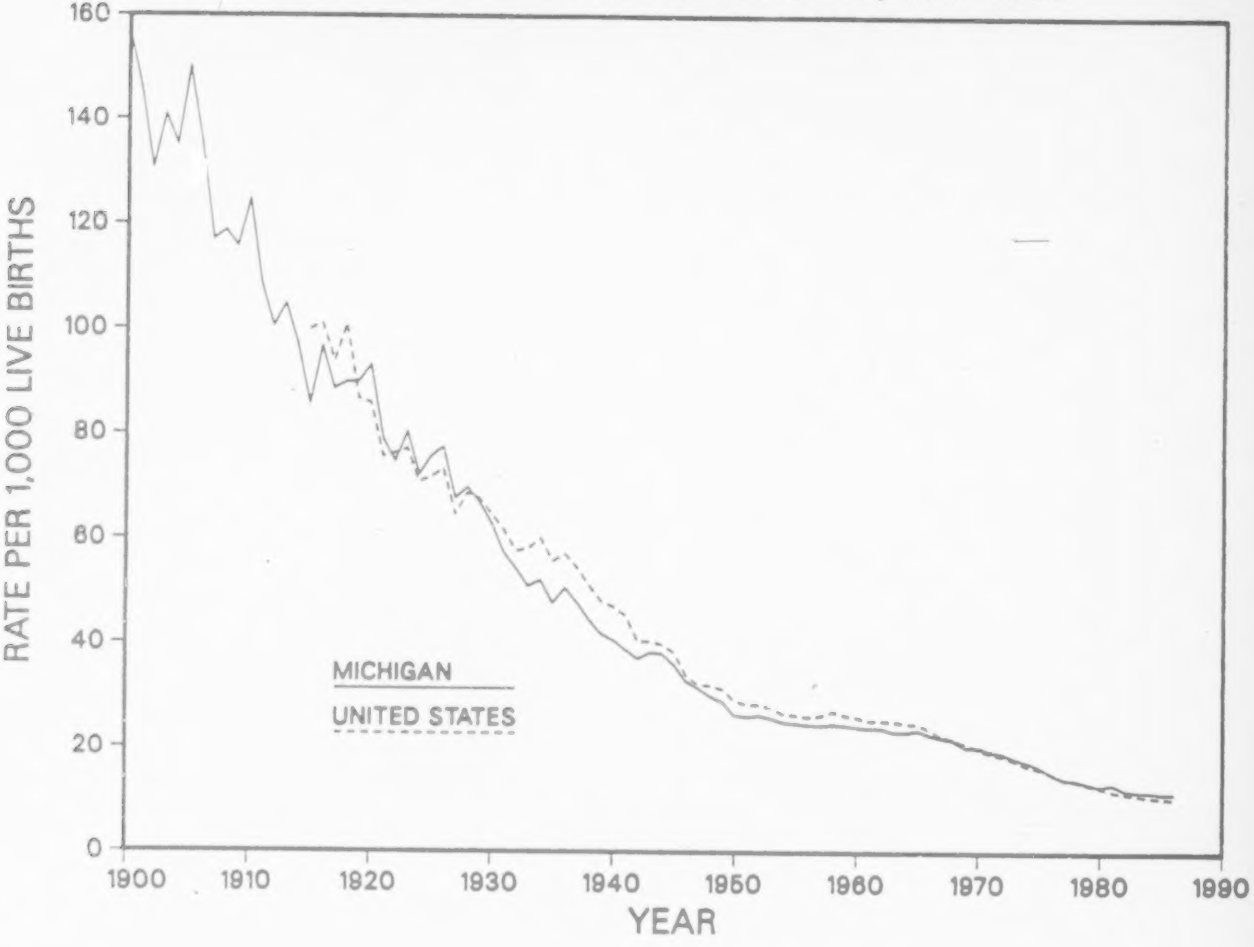
A review of Table 2.53 reveals that the 24.5 percent decline in the infant mortality rate since 1976 stems largely from reductions in the rate of death for those less than 7 days of age. There are 3.69 fewer infant deaths per 1,000 live births in 1986 than in 1976. Of these, there were 1.37 and 1.34 fewer infant deaths per 1,000 live births, respectively, for ages under 1 day of life and 1 to 6 days in 1986 than in 1976. They represented 73.4 percent of the reduction.

The death rate for infants during their first day of life has declined 21.7 percent since 1976. The rate decreased between 1976 and 1978, increased in the three years following 1978, and has generally decreased since 1981. The death rate for ages 1-6 days has declined steadily by 43.8 percent between 1976 and 1986. In contrast, the death rate for infants aged 7-27 days decreased 19.7 percent below the 1976 level. The death rate for infants aged 28-364 days have generally decreased between 1976 and 1986. In 1986 the death rate for infants aged 28-364 days was 3.53, which was 16.4 percent below the comparable rate for 1976.

Infant mortality rates have varied considerably by race. Rates for white, black and other race infants since 1970 are graphically displayed in Figure 2.50. Rates for black infants were higher than rates for both other groups throughout the period. Except for the years 1971 and 1976, the death rates for infants of other races were below those for white infants. Although the rates for all three race groups have declined, those for infants of other races decreased by a relatively larger amount than those for white and black infants, while the rates for white infants decreased more than the rates for black infants. As a result, the racial differentials in infant mortality rates have increased since 1970.

FIGURE 2.49

INFANT MORTALITY RATES, MICHIGAN RESIDENTS, 1900-1986 AND UNITED STATES[1] RESIDENTS, 1915-1986



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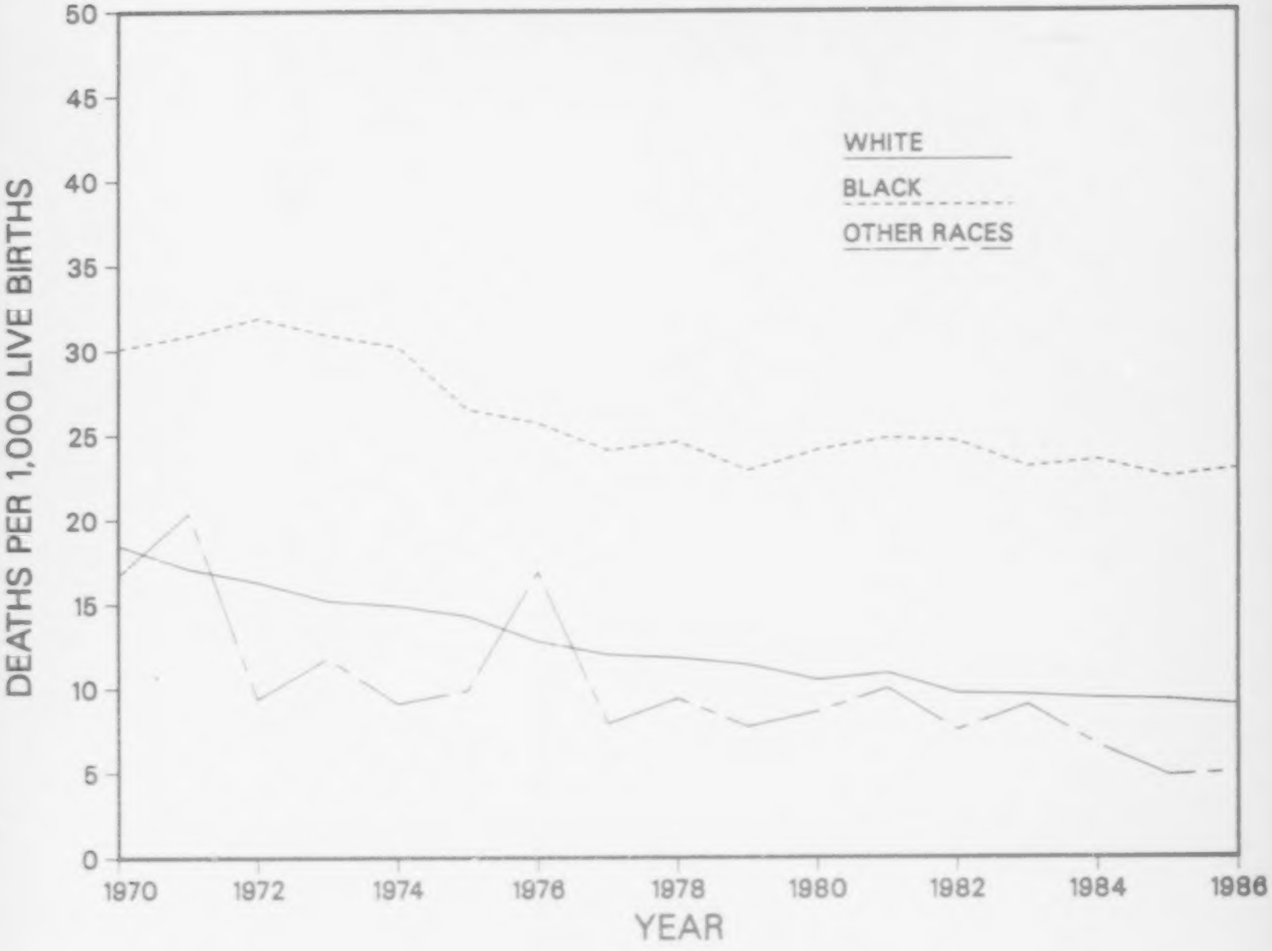
[1] United States rate for 1986 is provisional.

Table 2.53
Infant Deaths and Mortality Rates by Age at Death, Michigan Residents, 1976-1986

YEAR	AGE AT DEATH									
	TOTAL INFANT DEATHS		UNDER 1 DAY		1-6 DAYS		7-27 DAYS		28-364 DAYS	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
1976	1,978	15.06	829	6.31	402	3.06	193	1.47	554	4.22
1977	1,945	14.05	794	5.74	374	2.70	199	1.44	578	4.18
1978	1,931	13.91	717	5.17	384	2.77	180	1.30	650	4.68
1979	1,921	13.30	754	5.22	356	2.46	185	1.28	626	4.33
1980	1,851	12.75	790	5.44	310	2.14	184	1.27	567	3.91
1981	1,851	13.17	815	5.80	296	2.11	170	1.21	570	4.05
1982	1,672	12.12	751	5.44	284	2.06	167	1.21	470	3.41
1983	1,573	11.82	672	5.05	238	1.79	157	1.18	506	3.80
1984	1,595	11.75	718	5.29	237	1.75	145	1.07	495	3.65
1985	1,575	11.41	697	5.05	217	1.57	157	1.14	504	3.65
1986	1,565	11.37	680	4.94	237	1.72	162	1.18	486	3.53

FIGURE 2.50
INFANT DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1970-1986



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[1] Other than white rates for 1950-1969 are based on deaths of unknown race as well as deaths of races other than white.

Since 1970, the infant mortality rate for infants of other races dropped 70.1 percent. In the same period the rate for white infants dropped by 51.4 percent while for black infants the decline was 23.6 percent. The rate for black infants of 30.1 in 1970 was 62.7 percent higher than that for white infants (18.5) and 80.2 percent higher than the rate for infants of other races (16.7). The infant death rate for white infants in 1970 was 10.8 percent higher than the corresponding rate for infants of other races. In 1986 the rate for black infants of 23.0 was 2.6 times that for white infants (9.0) and 4.6 times that for infants of other races (5.0). The white infant death rate in 1986 was 80.0 percent higher than the rate for infants of other races.

Michigan resident infant deaths in 1986 are listed by cause of death classification and age at death in Table 2.54. Congenital anomalies caused the death of 291 infants and was the specific disease category most frequently reported. Sudden infant death syndrome was responsible for 244 infant deaths in 1986, while respiratory distress syndrome was listed as the cause of 164 deaths.

Over half (53.7 percent) of all infant deaths were attributed to conditions originating in the perinatal period. This proportion was 81.6 percent for deaths which occurred during the first day, 67.1 percent for deaths of infants at ages 1 through 6 days, and 50.0 percent for deaths of infants 1-3 weeks of age. This percentage was 8.6 percent for infants from 1-5 months and 11.3 percent for those 6-11 months of age.

The most frequent specific cause of death category during the first day was disorders relating to short gestation and unspecified low birthweight (21.2 percent). Congenital anomalies were responsible for 16.6 percent of the deaths during the first day of life. Respiratory distress syndrome and other respiratory conditions of the newborn caused 10.9 and 10.3 percent of the deaths under 1 day of age, respectively.

Congenital anomalies and respiratory distress syndrome were the leading causes of death for infants 1-6 days of age (27.4 percent and 26.6 percent, respectively). For infants who died at 1-3 weeks of age the most frequent causes were congenital anomalies (25.9 percent) and sudden infant death syndrome (14.8 percent). Sudden infant death syndrome was reported as the cause of 52.8 percent of the deaths to infants from 1-5 months of age. The leading cause of death for infants from 6-11 months of age were sudden infant death syndrome (18.3 percent) and congenital anomalies (17.4 percent). The 12 deaths due to accidents to infants aged 6-11 months represent 10.4 percent of the total deaths in this age group, while accidental deaths represent only 1.5 percent of all infant deaths.

Infant deaths and death rates by cause are shown in Table 2.55 for infants of white, black and other races. The most frequent causes of death for white infants were congenital anomalies (233 deaths), sudden infant death syndrome (157 deaths), respiratory distress syndrome (113 deaths), other respiratory conditions of newborn (86 deaths) and a grouping of all other and ill-defined conditions originating in the perinatal period (86). For black infants this grouping was the leading cause of death with 96 infants deaths. This cause was followed by sudden infant death syndrome (86 deaths), disorders relating to short gestation and unspecified low birthweight (79 deaths), congenital anomalies (57 deaths) and respiratory distress syndrome (49 deaths). There were a total of 12 deaths for infants of other races, 9 of which (75

Table 2.54
Infant Deaths by Age at Death and Underlying Cause,
Michigan Residents, 1986

ICD - 9 CODE	CAUSE OF DEATH	AGE AT DEATH					
		TOTAL UNDER 1 YEAR	UNDER 1 DAY	1-6 DAYS	7-27 DAYS	1-5 MONTHS	6-11 MONTHS
8, 9, 535, 555-558	Certain gastrointestinal diseases	9	-	-	1	5	3
38	Septicemia	6	-	-	-	6	-
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	12	-	-	1	5	6
320-322	Meningitis	4	-	-	3	1	-
480-487	Pneumonia and Influenza	13	-	-	1	9	3
740-759	Congenital anomalies	291	113	65	42	51	20
761	Newborn affected by maternal complications of pregnancy	74	68	4	-	2	-
762	Newborn affected by complications of placenta, cord and membranes	44	41	2	-	1	-
765	Disorders relating to short gestation and unspecified low birthweight	154	144	9	-	1	-
767	Birth trauma	8	3	4	1	-	-
768	Intrauterine hypoxia and birth asphyxia	29	17	5	6	1	-
769	Respiratory distress syndrome	164	74	63	19	8	-
770	Other respiratory conditions of newborn	139	70	23	20	13	13
771	Infections specific to the perinatal period	35	11	11	11	2	-
772	Neonatal hemorrhage	9	3	4	2	-	-
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	184	124	34	22	4	-
760-779	Certain conditions originating in the perinatal period	840	555	159	81	32	13
798.0	Sudden infant death syndrome	244	-	3	24	196	21
E800-E949	Accidents and adverse effects	24	-	-	-	12	12
E960-E969	Homicide	14	2	2	-	5	5
Residual	All other causes	108	10	8	9	49	32
	Total	1,565	680	237	162	371	115

Table 2.55
Infant Deaths and Infant Death Rates by Race of Infant and Underlying Cause, Michigan Residents, 1986

ICD - 9 CODE	CAUSE OF DEATH	RACE OF INFANT							
		TOTAL[1]		WHITE		BLACK		ALL OTHER	
		NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
8, 9, 535, 555-558	Certain gastrointestinal diseases	9	6.5	5	*	4	*	-	*
38	Septicemia	6	4.4	4	*	2	*	-	*
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	12	8.7	7	5.3	5	*	-	*
320-322	Meningitis	4	*	4	*	-	*	-	*
480-487	Pneumonia and influenza	13	9.4	9	8.1	4	*	-	*
740-759	Congenital anomalies	291	211.4	233	209.7	57	236.7	1	*
761	Newborn affected by maternal complications of pregnancy	74	53.8	42	37.8	32	132.9	-	*
762	Newborn affected by complications of placenta, cord and membranes	44	32.0	27	24.3	15	62.3	2	*
765	Disorders relating to short gestation and unspecified low birthweight	154	111.9	75	67.5	79	328.1	-	*
767	Birth trauma	8	5.8	6	5.4	2	*	-	*
768	Intrauterine hypoxia and birth asphyxia	29	21.1	15	13.5	14	58.1	-	*
769	Respiratory distress syndrome	164	119.2	113	101.7	49	203.5	2	*
770	Other respiratory conditions of newborn	139	101.0	86	77.4	50	207.7	3	*
771	Infections specific to the perinatal period	35	25.4	26	23.4	9	37.4	-	*
772	Neonatal hemorrhage	9	6.5	6	5.4	3	*	-	*
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	184	133.7	86	77.4	96	398.7	2	*
760-779	Certain conditions originating in the perinatal period	840	610.3	482	433.8	349	1,449.5	9	377.8
798.0	Sudden infant death syndrome	244	177.3	157	141.3	86	357.2	1	*
E800-E949	Accidents and adverse effects	24	17.4	20	18.0	3	*	-	*
E960-E969	Homicide	14	10.2	7	6.3	7	29.1	-	*
Residual	All other causes	108	78.5	71	63.9	36	149.5	1	*
	Total	1,565	1,137.1	999	899.1	553	2,296.7	12	503.8

[1] Records with race not stated are included only in total columns.

[2] Rates per 100,000 live births.

precent) were attributed to certain conditions originating in the perinatal period.

Cause-specific infant death rates for black infants were higher for all categories with sufficient events to calculate rates for racial groups. Relative differential in mortality rates due to congenital anomalies was small compared to the differentials for the other categories.

The infant death rate from all causes for males was 37.6 percent greater than that for females. The differentials for deaths due to respiratory distress syndrome and other respiratory diseases of the newborn were 52.1 percent and 49.4 percent respectively. The largest relative differential in rates by sex was for infections specific to the perinatal period where the rate for males was 2.1 times that for females (Table 2.56).

Infant mortality rates by race are presented in Table 2.57. These data are from a file of merged live birth and infant death information. The rates presented are for Michigan residents born in 1985. Note that this matched file is approximately 96.9 percent complete and, therefore, the rates presented are understated.

The rates for black infants (22.0) and American Indian infants (13.4) were 2.4 and 1.5 times, respectively, that for white infants (9.1). The rate for other races (3.9) was 57.1 percent less than the white infant death rate. The death rate for infants aged less than seven days (hebdomadal deaths) showed similar variations by race for those races with sufficient data to calculate rates (Table 2.58).

Data from the matched file on infant mortality rates by age of mother and race of child are presented in Table 2.59. Infant death rates display a parabolic relationship with mother's age. The rates were highest for infants born to mothers under age 20. The infant mortality rates of 19.9 and 16.1 for mothers under 15 years old and 15-19 years old, respectively, were 2.2 times and 1.8 times as high as the lowest rate of 9.2 for mothers aged 25-29 years. The infant mortality rate for mothers 40 or over was 71.7 percent greater than the lowest age-specific rate.

Rates for white infants generally follow the above pattern of association with mother's age. For black infants, the rates increased slightly with mother's age, reaching a peak of 23.5 for mothers 30-39 years old. Rates for black infants were significantly above those for the white group in all categories with a sufficient number of events to calculate rates. The smallest differential was for mothers over 40 years of age. Overall, the rate for black infants was 2.4 times that for white infants and 3.1 times that for infants of other races. The overall white infant death rate was 30 percent greater than the rate for infants of other races.

Table 2.60 displays the variation in infant death rates according to the number of the mother's prenatal visits. The infant death rate for mothers who had no prenatal care was 85.5, 16.4 times as high as the low rate of 5.2 for mothers who had 15-19 prenatal visits. The rate associated with mothers who had 1-4 visits was 16.3 times the low rate, while the rate associated with mothers who had 5-9 visits was 4.0 times as high as the low rate. The infant death rate for mothers with 20 or more prenatal visits was 57.7 percent greater

Table 2.56
Infant Deaths and Infant Death Rates by Sex of Infant and Underlying Cause, Michigan Residents, 1986

ICD - 9 CODE	CAUSE OF DEATH	SEX OF INFANT					
		TOTAL[1]		MALE		FEMALE	
		NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
8, 9, 535, 555-558	Certain gastrointestinal diseases	9	6.5	7	9.9	2	*
38	Septicemia	6	4.4	2	*	4	*
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	12	8.7	6	8.5	6	9.0
320-322	Meningitis	4	*	2	*	2	*
480-487	Pneumonia and influenza	13	9.4	7	9.9	6	9.0
740-759	Congenital anomalies	291	211.4	175	247.8	115	171.6
761	Newborn affected by maternal complications of pregnancy	74	53.8	40	56.6	34	50.7
762	Newborn affected by complications of placenta, cord and membranes	44	32.0	24	34.0	20	29.8
765	Disorders relating to short gestation and unspecified low birthweight	154	111.9	91	128.9	60	89.5
767	Birth trauma	8	5.8	6	8.5	2	*
768	Intrauterine hypoxia and birth asphyxia	29	21.1	15	21.2	14	20.9
769	Respiratory distress syndrome	164	119.2	101	143.0	63	94.0
770	Other respiratory conditions of newborn	139	101.0	85	120.4	54	80.6
771	Infections specific to the perinatal period	35	25.4	24	34.0	11	16.4
772	Neonatal hemorrhage	9	6.5	5	*	4	*
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	184	133.7	101	143.0	83	123.9
760-779	Certain conditions originating in the perinatal period	840	610.3	492	696.7	345	514.9
798.0	Sudden infant death syndrome	244	177.3	147	208.2	97	144.8
E800-E949	Accidents and adverse effects	24	17.4	14	19.8	10	14.9
E960-E969	Homicide	14	10.2	8	11.3	6	9.0
Residual	All other causes	108	78.5	64	90.6	44	65.7
	Total	1,565	1,137.1	924	1,308.5	637	950.7

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[1] Records with sex not stated are included only in total columns

[2] Rates per 100,000 live births

Table 2.57

Infant Deaths, Live Births, and Infant Death Rates[2] by Race Michigan Resident Infants Born in 1985

RACE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
All Races	1,545	138,052	11.2
White	1,030	112,994	9.1
Black	498	22,659	22.0
American Indian	10	748	13.4
Other Races	6	1,538	3.9
Unknown	1	113	*

Table 2.58

Hebdomadal Deaths[1] and Death Rates[2] by Race, Michigan Resident Infants Born in 1985

RACE	HEBDOMADAL DEATHS	HEBDOMADAL DEATH RATE
All Races	902	6.5
White	571	5.1
Black	322	14.2
American Indian	3	*
Other Races	5	3.3
Unknown	1	*

[1] Deaths to infants less than seven days old.

[2] Per 1,000 live births.

Table 2.59
Infant Deaths, Live Births, and Infant Death Rates by Age of Mother and Race[1] of Infant, Michigan Resident Infants Born in 1985

AGE OF MOTHER	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
All Ages	1,545	138.052	11.2	1,030	112,994	9.1	498	22,659	22.0	16	2.286	7.0
Under 15 Years	7	352	19.9	3	108	*	4	240	*	-	3	-
15-19 Years	262	16,279	16.1	155	10,945	14.2	104	5,143	20.2	2	185	*
20-24 Years	490	41,125	11.9	323	33,357	9.7	160	7,176	22.3	7	563	12.4
25-29 Years	432	47,049	9.2	301	40,458	7.4	129	5,774	22.3	2	784	*
30-39 Years	340	32,355	10.5	237	27,418	8.6	98	4,172	23.5	5	725	6.9
40 or More Years	14	887	15.8	11	705	15.6	3	153	19.6	-	26	-
Age Not Stated	-	5	*	-	3	*	-	1	*	-	-	-

[1] Race not stated included in total columns only.

Table 2.60
Infant Deaths, Live Births and Infant Death Rates by Prenatal Visits and Race[1] of Infant, Michigan Resident Infants Born in 1985

NUMBER OF VISITS	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
Total	1,545	138,052	11.2	1,030	112,994	9.1	498	22,659	22.0	16	2,296	7.0
0	74	865	85.5	37	478	77.4	37	370	100.0	-	17	-
1-4	291	3,429	84.9	161	2,089	77.1	127	1,267	100.2	3	72	*
5-9	510	24,467	20.8	330	18,735	17.6	175	5,197	33.7	5	528	9.5
10-14	464	85,876	5.4	350	72,774	4.8	109	11,769	9.3	5	1,316	3.8
15-19	84	16,095	5.2	72	13,142	5.5	11	2,719	4.0	1	231	*
20 or Over	31	3,771	8.2	20	2,978	6.7	10	738	13.6	1	53	*
Unknown	91	3,549	25.6	60	2,798	21.4	29	599	48.4	1	69	*

[1] Race not stated included in total columns only.

than the low rate, reflecting the likelihood that a high number of prenatal visits was connected with a problem pregnancy.

Infant death rates increased when the mother received less adequate prenatal care as measured by the Kessner Index (Table 2.61). The infant death rate was 2.9 times greater for mothers with inadequate care (25.5 deaths per 1,000 live births) than for mothers with adequate care (8.9 deaths per 1,000 live births) and 2.0 times greater for mothers with intermediate care (13.0 deaths per 1,000 births). The pattern was similar for both white and black births. When the mother received adequate care based on the number of visits, the month prenatal care began and the length of gestation, the infant death rate for black infants (17.5) was 2.3 times greater than for white infants (7.5 deaths per 1,000 live births) and 3.0 times greater than for infants of other races. For mothers with adequate care, the infant death rate for white infants was 27.1 percent greater than the rate for infants of other races.

Mothers with fewer than ten prenatal visits had 20.8 percent of all live births but 56.6 percent of all infant deaths. Mothers who had ten or more prenatal visits had 76.6 percent of the live births and 37.5 percent of the infant deaths. The infant death rate for mothers who had fewer than ten prenatal visits was 30.4. This was 5.5 times the rate of 5.5 for mothers who had ten or more prenatal visits.

The differential in mortality rates between black and white infants noted above is significantly altered when comparisons are made within the same range of prenatal visits. While the overall rate for black infants was 2.4 times that for white infants, for mothers who had 1-4 prenatal visits the rates for black infants were much closer to the rates for white infants (30.0 percent greater). For mothers with fewer than ten prenatal visits, the infant mortality rate for white infants was 24.8 and that for black infants 49.6. For mothers with ten or more prenatal visits, the rate for white infants was 5.0 and for black infants 8.5.

The rate for black infants was, thus, 100 percent greater where the mother had fewer than ten prenatal visits and 70 percent greater where the mother had ten or more visits. Both of these racial differentials were less than the overall racial differential of 142 percent. This seemingly paradoxical result is explained by the differing distributions of the white and the black births. The overall infant mortality rate for each race is a weighted sum of the infant mortality rates for the different prenatal care categories. The weight for each prenatal care category is the ratio of the number of live births in that category to the total number of live births. Since a greater proportion of the black live births are to mothers in the categories with fewer prenatal visits, the higher infant mortality rates in the categories with fewer prenatal visits are more heavily weighted for the black population.

When deaths under one week are added to fetal deaths, the total is called perinatal deaths. By placing a ceiling of six days for the infant component of perinatal deaths, most postnatal accidental and environmental causes of death are eliminated. In 1985, Michigan resident perinatal deaths numbered 1,855 and the perinatal death rate was 13.3. This rate was 13.7 in 1984 and 26.0 in 1970.

As with infant death rates, perinatal death rates vary considerably with race, age of mother, and number of prenatal visits. Tables 2.62 and 2.63 show perinatal deaths and rates by age of mother, the number of the mother's prenatal visits, and the race of the fetus or in-

Table 2.61
Infant Deaths, Live Births and Infant Death Rates by Level of Prenatal Care and Race[1] of Infant Michigan Resident Infants Born in 1985

LEVEL OF CARE (KESSNER INDEX[2])	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
Total	1,545	138,052	11.2	1,030	112,994	9.1	498	22,659	22.0	16	2,286	7.0
Adequate	893	100,899	8.9	637	85,274	7.5	247	14,090	17.5	9	1,515	5.9
Intermediate	338	26,066	13.0	211	19,716	10.7	123	5,811	21.2	4	534	*
Inadequate	214	8,391	25.5	119	5,912	20.1	92	2,283	40.3	3	192	*
Unknown	100	2,696	37.1	63	2,092	30.1	36	475	75.8	-	45	-

[1] Race not stated included in total columns only.

[2] The Kessner Index is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

fant for fetal deaths and live births occurring in 1985. The data for hebdomadal deaths are drawn from a merged file of birth and death data. As a result, perinatal deaths and rates are slightly understated.

Table 2.62 makes clear the increased risk of death to fetuses and infants of mothers under 20 years of age or 30 or greater years of age. Minimum risk in 1985 was associated with mothers 25-29 years of age. Table 2.63 indicates that the risk of perinatal death was over twenty five times as great for fetuses and infants whose mothers had less than 5 prenatal visits compared to those whose mothers had 10-14 visits. The risk associated with 5-9 prenatal visits was 6.4 times as great as for the lowest risk category (10-14 visits).

The overall perinatal mortality rate for black fetuses and infants was over twice as high as for white fetuses and infants. The highest perinatal death rate for the black group was associated with mothers 30-39 years of age and for white fetuses and infants was associated with mothers 40 or more years of age for those age categories with sufficient data to calculate rates. The minimum risk was associated with mothers 25-29 years of age for white fetuses and infants and with mothers 15-19 years of age for black fetuses and infants. The overall perinatal mortality rate for fetuses and infants of races other than black and white was 32.7 and 70.0 percent less than for white and black fetuses and infants, respectively (Table 2.62).

For both white and black fetuses and infants the highest mortality rates were associated with mothers who received less than 5 prenatal visits. The perinatal death rates were higher for black fetuses and infants than for white fetuses and infants for every category of the number of prenatal care visits except 15-19 visits. The highest differential was 125.9 percent when the mother had 20 or more visits. The differential was least for the 1-4 visits category where the black perinatal mortality rate was 2.8 percent more than the white rate.

The perinatal death rates increased for mothers with less than adequate prenatal care. The death rate was 3.2 times higher for mothers with inadequate care than for mothers with adequate care (30.3 vs 9.4 deaths per 1,000 live births and fetal deaths, respectively). The perinatal death rate of black fetuses and infants of mothers with adequate care was twice as high as the rate for white fetuses and infants and 2.8 times higher than the rate for fetuses and infants of races other than black and white with the same level of prenatal care. The rate for black fetuses and infants of mothers with inadequate care was 60.7 percent higher than the rate for white fetuses and infants of mothers with inadequate care (Table 2.64).

The median birth weight of infants born in 1985 and dying prior to 1 year of age was 1,332 grams (Table 2.65). The median birth weight of all Michigan resident live births in 1985 was 3,402 grams. For all maternal age groups, the median birth weight for infant deaths was well below the overall median birth weight for liveborn infants in 1985.

Infant death rates by race, birth weight and age at death are displayed in Table 2.66 for infants born in 1985. While the overall infant death rate for black infants was 2.4 times that of white infants, the rates for white and black infants were quite similar for infants born weighing 1500 grams or less. The rate for white infants weighing 1501-2499 grams was the same as the comparable rate for black infants. For infants weighing 2,500 grams or

Table 2.62
Perinatal Deaths, Total Births, and Perinatal Death Rates by Age of Mother and Race[1] of Infant or Fetus, Births to Michigan Residents in 1985

AGE OF MOTHER	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE
All Ages	1,855	139,005	13.3	1,245	113,668	11.0	565	22,902	24.7	17	2,295	7.4
Under 15 Years	5	355	14.1	1	108	*	4	243	*	-	3	-
15-19 Years	270	16,408	16.5	149	11,019	13.5	114	5,193	22.0	2	186	*
20-24 Years	527	41,390	12.7	352	33,552	10.5	167	7,241	23.1	5	565	*
25-29 Years	532	47,325	11.2	381	40,661	9.4	138	5,834	23.7	4	788	*
30-39 Years	485	32,605	14.9	347	27,610	12.6	130	4,226	30.8	6	727	8.3
40 or More Years	16	897	17.8	12	712	16.9	4	156	*	-	26	-
Age Not Stated	20	25	800.0	3	6	*	8	9	888.9	-	-	-

[1] Race not stated included in total columns only.

Table 2.63
Perinatal Deaths, Total Births and Perinatal Death Rates by Prenatal Visits and Race[1] of Infant or Fetus, Births to Michigan Residents in 1985

NUMBER OF VISITS	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE
Total	1,855	139,005	13.3	1,245	113,668	11.0	565	22,902	24.7	17	2,295	7.4
0	95	908	104.6	46	498	92.4	48	392	122.4	1	18	*
1-4	380	3,582	106.1	232	2,198	105.6	142	1,307	108.6	4	74	*
5-9	654	24,789	26.4	462	18,981	24.3	185	5,269	35.1	5	530	*
10-14	357	86,066	4.1	286	72,936	3.9	66	11,793	5.6	4	1,319	*
15-19	67	16,124	4.2	55	13,167	4.2	11	2,723	4.0	1	231	*
20 or Over	25	3,780	6.6	16	2,985	5.4	9	740	12.2	-	53	-
Unknown	277	3,756	73.7	148	2,901	51.0	104	678	153.4	2	70	*

[1] Race not stated included in total columns only

Table 2.64
Perinatal Deaths, Total Births and Perinatal Death Rates by Level of Prenatal Care and Race[1] of Infant, Births to Michigan Residents in 1985

LEVEL OF CARE (KESSNER INDEX[2])	ALL INFANTS			WHITE INFANTS			BLACK INFANTS			ALL OTHER INFANTS		
	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE
Total	1,855	139,005	13.3	1,245	113,668	11.0	565	22,902	24.7	17	2,295	7.4
Adequate	948	101,337	9.4	701	85,633	8.2	235	14,161	16.6	9	1,520	5.9
Intermediate	506	26,381	19.2	292	19,893	14.7	189	5,927	31.9	5	536	*
Inadequate	258	8,527	30.3	157	6,002	26.2	98	2,327	42.1	2	193	*
Unknown	143	2,760	51.8	95	2,140	44.4	43	487	88.3	1	46	*

[1] Race not stated included in total columns only.

[2] The Kessner Index is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e., for shorter pregnancies, fewer prenatal visits constitute adequate care).

Table 2.65
Infant Deaths by Birth Weight and Mother's Age, Michigan Resident Infants Born in 1985

BIRTH WEIGHT IN GRAMS	TOTAL	MOTHER'S AGE					
		UNDER 15	15-19	20-24	25-29	30-39	40 OR MORE
Total	1,545	7	262	490	432	340	14
500 or Less	285	-	47	84	77	76	1
501-1,000	386	3	69	103	118	90	3
1,001-1500	129	-	19	41	38	29	2
1,501-2,000	86	1	19	31	18	17	-
2,001-2,499	134	1	18	44	38	32	1
2,500-3,000	160	-	33	58	42	25	2
3,001-3,500	192	1	31	61	55	41	3
3,501-4,000	106	-	19	40	30	17	-
4,001-4,500	38	-	4	16	13	4	1
4,501 and Over	7	-	-	2	2	3	-
Not Stated	22	1	3	10	1	6	1
Median Weight in Grams	1,332	1,899	1,300	1,729	1,247	1,042	2,160

Table 2.66

Live Births by Birth Weight and Race of Infant and Infant Deaths and Infant Death Rates by Birth Weight, Age at Death, and Race of Infant, Michigan Resident Infants Born in 1985

BIRTHWEIGHT	RACE OF INFANT	LIVE BIRTHS	AGE AT DEATH					
			UNDER 1 YEAR		UNDER 28 DAYS		28-364 DAYS	
			NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
Total	All Races	138,052	1,545	11.2	1,054	7.6	491	3.6
	White	112,994	1,030	9.1	684	6.1	346	3.1
	Black	22,659	498	22.0	360	15.9	138	6.1
	All Other[1]	2,286	16	7.0	9	3.9	7	3.1
Less Than 1,501 Grams	All Races	1,869	800	428.0	720	385.2	80	42.8
	White	1,110	476	428.8	423	381.1	53	47.7
	Black	743	318	428.0	291	391.7	27	36.3
	All Other[1]	16	6	375.0	6	375.0	-	-
1,501-2,499 Grams	All Races	7,534	220	29.2	135	17.9	85	11.3
	White	5,065	149	29.4	102	20.1	47	9.3
	Black	2,347	69	29.4	33	14.1	36	15.3
	All Other[1]	116	2	*	-	-	2	*
2,500 Grams Or Greater	All Races	128,613	503	3.9	178	1.4	325	2.5
	White	106,792	388	3.6	143	1.3	245	2.3
	Black	19,561	107	5.5	32	1.6	75	3.8
	All Other[1]	2,154	8	3.7	3	*	5	2.3
Unknown Birthweight	All Races	36	22	611.1	21	583.3	1	*
	White	27	17	629.6	16	592.6	1	*
	Black	8	4	*	4	*	-	-
	All Other[1]	-	-	-	-	-	-	-

[1] Race not stated included in total rows only.

more the rate for black infants exceeded by 52.8 percent that for white infants. A large part of the difference between infant death rates for white and black infants was due to the fact that a greater proportion of the black infants were born at weights below 2,500 grams (13.6 percent for black infants compared to 5.5 percent for white infants).

The differentials in death rates by race for deaths under 28 days (neonatal deaths) and from 28-364 days (postneonatal deaths) were similar to that for all infant deaths. The neonatal rate for white infants weighing 1501-2499 grams was 42.6 percent greater than the comparable rate for black infants while the postneonatal death rate for black infants in this birth weight category exceeded the comparable rate for white infants by 64.5 percent. For infants weighing 2500 grams or more at birth, the rates were greater for black infants by 23.1 percent and 65.2 percent, respectively, for neonatal and postneonatal deaths.

COMMUNICABLE DISEASE DEATHS

Although comprising a smaller proportion of deaths than they have in the past, communicable disease deaths continue to be a public health concern. In 1986, deaths from all infectious and parasitic diseases numbered 969. As can be observed from Table 2.67, over two-thirds of these deaths were caused by septicemia (659 deaths). Mycoses and tuberculosis caused 52 and 44 deaths, respectively. When deaths attributed to late effects of tuberculosis are included, the number of deaths from tuberculosis rises to 46.

The distribution of infectious and parasitic disease deaths by age, race, and sex for 1986 is given in Table 2.68, and the corresponding death rates are shown in Table 2.69. Note that deaths to black persons accounted for 20.6

Table 2.67
Deaths from Selected Infectious and Parasitic Diseases,
Michigan Residents, 1986

ICD LIST[1] NUMBER	CAUSE OF DEATH	FREQUENCY
038	Septicemia	659
110 - 118	Mycoses	52
010 - 018	Tuberculosis	44
136.3	Pneumocystosis	36
070	Viral Hepatitis	24
135	Sarcoidosis	18
036	Meningococcal Infection	15
054	Herpes Simplex	11
053	Herpes Zoster	8
046	Slow Virus Infection of Central Nervous System	7
040.0	Gas Gangrene	3
137	Late Effects of Tuberculosis	2
052	Chickenpox	1
Residual 000 - 139	All Other Infectious and Parasitic Diseases	89
000 - 139	Total	969

Table 2.68
Deaths Due to Infectious and Parasitic Diseases by Age, Race, and Sex, Michigan Residents, 1986

AGE	TOTAL	MALE			FEMALE		
		WHITE	BLACK	OTHER RACES	WHITE	BLACK	OTHER RACES
All Ages	969	364	99	2	400	101	3
Under 1 Year	23	5	7	-	7	4	-
1-19 Years	21	7	6	1	5	1	1
20-44 Years	98	44	26	-	12	16	-
45-64 Years	156	55	24	-	60	16	1
65 or Over	671	253	36	1	316	64	1

Table 2.69
Infectious and Parasitic Diseases Death Rates by Age, Race, and Sex, Michigan Residents, 1986

AGE	TOTAL	MALE			FEMALE		
		WHITE	BLACK	OTHER RACES	WHITE	BLACK	OTHER RACES
All Ages	10.6	9.5	17.1	*	10.0	15.5	*
Under 1 Year	16.6	8.6	63.2	*	12.7	*	*
1-19 Years	0.8	0.6	2.7	*	0.5	*	*
20-44 Years	2.7	2.9	12.0	*	0.8	6.2	*
45-64 Years	9.1	7.5	27.8	*	7.7	15.3	*
65 or Over	64.7	66.9	87.6	*	56.5	110.7	*

percent of all infectious and parasitic disease deaths but only 14.1 percent of deaths from all causes. The death rates were highest for persons aged 65 years and over (64.7 deaths per 100,000 population) and for infants under 1 year (16.6). Rates for black males were highest, followed by those for black females, white females and white males respectively.

Deaths due to such diseases as diphtheria, scarlet fever, streptococcal sore throat, small pox, typhoid fever, measles, poliomyelitis and others have been virtually eliminated not only in Michigan, but across the nation. Table 4.7 illustrates trends in deaths from the major communicable diseases.

INJURY AT WORK

There were 176 deaths reported as resulting from injuries at work in 1986, 12 less than in 1985 (Table 2.70). These include all cases in which the underlying cause of death was external and the injury was reported to have occurred at work, whether or not the injury was work-related.

Table 2.70
Deaths Due to Injury at Work by Place of Injury,
Michigan Residents, 1986

PLACE	NUMBER OF DEATHS
Industrial Place and Premises	56
Street and Highway	46
Public Building	30
Farm	13
Home	8
Place for Recreation and Sport	5
Mine and Quarry	3
Resident Institution	-
Other Specified Places	15
Place Not Specified	-
Total	176

Table 2.70 gives the frequency of deaths due to injuries at work by place of occurrence. The most common sites were industrial places and premises with 56 deaths. Injuries on streets and highways caused 46 deaths followed by injuries in public buildings with 30 deaths. There were 13 deaths from injuries taking place on farms.

The most frequent cause of death associated with injuries at work was motor vehical traffic accidents which resulted in 36 deaths or 20.5 percent of all such deaths (Table 2.71). The second most common cause was homicide and legal interventions, accounting for 34 deaths and 19.3 percent of the total. Accidents caused by machinery accounted for 29 deaths.

TABLE 2.71

DEATHS DUE TO INJURY AT WORK BY CAUSE OF DEATH, MICHIGAN RESIDENTS, 1986

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
E810-E819	Motor Vehicle Traffic Accidents	36	20.5
E960-E978	Homicide and Legal Intervention	34	19.3
E919	Accidents Caused by Machinery	29	16.5
E880-E888	Accidental Falls	17	9.7
E925	Accidents Caused by Electric Current	14	8.0
E916	Struck Accidentally by Falling Object	9	5.1
E840-E845	Air and Space Transport Accidnts	5	2.8
E820-E825	Motor Vehicle Nontraffic Accidents	5	2.8
E950-E959	Suicide	4	2.3
E913	Accidental Mechanical Suffocation	2	1.1
E910	Accidental Drowning & Submersion	1	0.6
E860-E869	Accidental Poisoning Caused by Gases & Vapors	1	0.6
E890-E899	Accident Caused by Fire and Flames	-	-
E928	Other & Unspecified Environmental & Accidental Causes	3	1.7
Ressidual E800-E949	All Other Accidents	16	9.1
	Total	176	100.0

[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

LIFE EXPECTANCY

The life expectancy of a Michigan resident at birth was 74.1 years, based on 1986 mortality and population data. Females demonstrated a significantly greater longevity than males. In 1986 the life expectancy at birth was 70.7 years for males and 77.4 years for females. This results from the higher mortality rates of males at all ages.

Life expectancies by sex in selected years for Michigan and United States residents are presented in Table 2.72. It can be seen that longevity has increased greatly in Michigan since 1901, by 17.3 years for males and by 22.3 years for females. Females born in Michigan in 1901 could expect to live 1.7 years longer than their male counterparts. By 1950 the differential in life expectancy between the sexes was 5.5 years. This disparity increased to 7.6 years by 1971, remained constant through 1973, and by 1986 had declined to 6.7 years. Between 1976 and 1986 life expectancy increased by 1.7 years for males and 1.5 years for females.

The life expectancy of Michigan residents was well above that for the nation in 1901, but this differential had virtually disappeared by 1950. In 1980 the life expectancy of males in Michigan was equal to that for males nationwide, at 70.0 years, while longevity for females residing in this state was 0.5 years below the average for the country. By 1986 the life expectancy of males and females in Michigan were 0.6 and 0.9 years, respectively, below the national provisional life expectancy. Note that females have consistently demonstrated greater longevity than males both in Michigan and in the United States.

White persons displayed a life expectancy 6.9 years greater than persons of all other races in 1986. The life expectancy of white males was 8.1 years greater than other than white males in 1986 compared to a differential of 5.8 years in 1950 (Table 2.73). In 1970 the differential was 7.2 years, due in part to an actual reduction in life expectancy for other than white males between 1960 and 1970. Since 1970 life expectancy for males of all other races has increased by 2.8 years, from 61.0 to 63.8 years while the life expectancy for white males rose 3.7 years. This is a reflection of the decline in mortality rates for several leading causes of death for these groups prior to 1981.

The differential by race for female life expectancies has declined over the 1950-1986 period. In 1950, Michigan resident white females had an average longevity 8.5 years greater than females of all other races. This disparity declined to 5.5 years in 1986.

The expected number of years of life remaining are presented graphically by age, race, and sex in Figure 2.51. The number of years of life remaining for females was greater than that for males throughout life. The average number of years remaining for white males and females surpassed or equaled that of their black counterparts for all age groups. However, black persons displayed similar life expectancies with their white counterparts in the older age intervals.

Table 2.72
Life Expectancy at Birth by Sex, Michigan and United States Residents, Selected Years, 1901-1986

UNITED STATES		YEAR	MICHIGAN	
MALE	FEMALE		MALE	FEMALE
47.6	50.6	1901	53.4	55.1
48.4	51.8	1910	53.9	56.2
53.6	54.6	1920	55.1[1]	56.0[1]
58.1	61.6	1930	59.8[1]	62.8[1]
60.8	65.2	1940	63.4[1]	67.4[1]
65.6	71.1	1950	65.7	71.2
66.6	73.1	1960	67.1	73.3
67.1	74.7	1970	67.2	74.6
67.4	75.0	1971	67.3	74.9
67.4	75.1	1972	67.3	74.9
67.6	75.3	1973	67.4	75.0
68.2	75.9	1974	68.0	75.3
68.8	76.6	1975	68.5	75.7
69.1	76.8	1976	69.0	75.9
69.5	77.2	1977	69.3	76.3
69.6	77.3	1978	69.6	76.4
70.0	77.8	1979	70.0	76.8
70.0	77.4	1980	70.0	76.9
70.4	77.8	1981	70.3	77.1
70.9	78.1	1982	70.6	77.4
71.0	78.1	1983	70.7	77.4
71.2	78.2	1984	70.8	77.2
71.2	78.2	1985	70.6	77.4
71.3[2]	78.3[2]	1986	70.7	77.4

[1] Michigan data for years 1920, 1930, and 1940 are for white persons only.

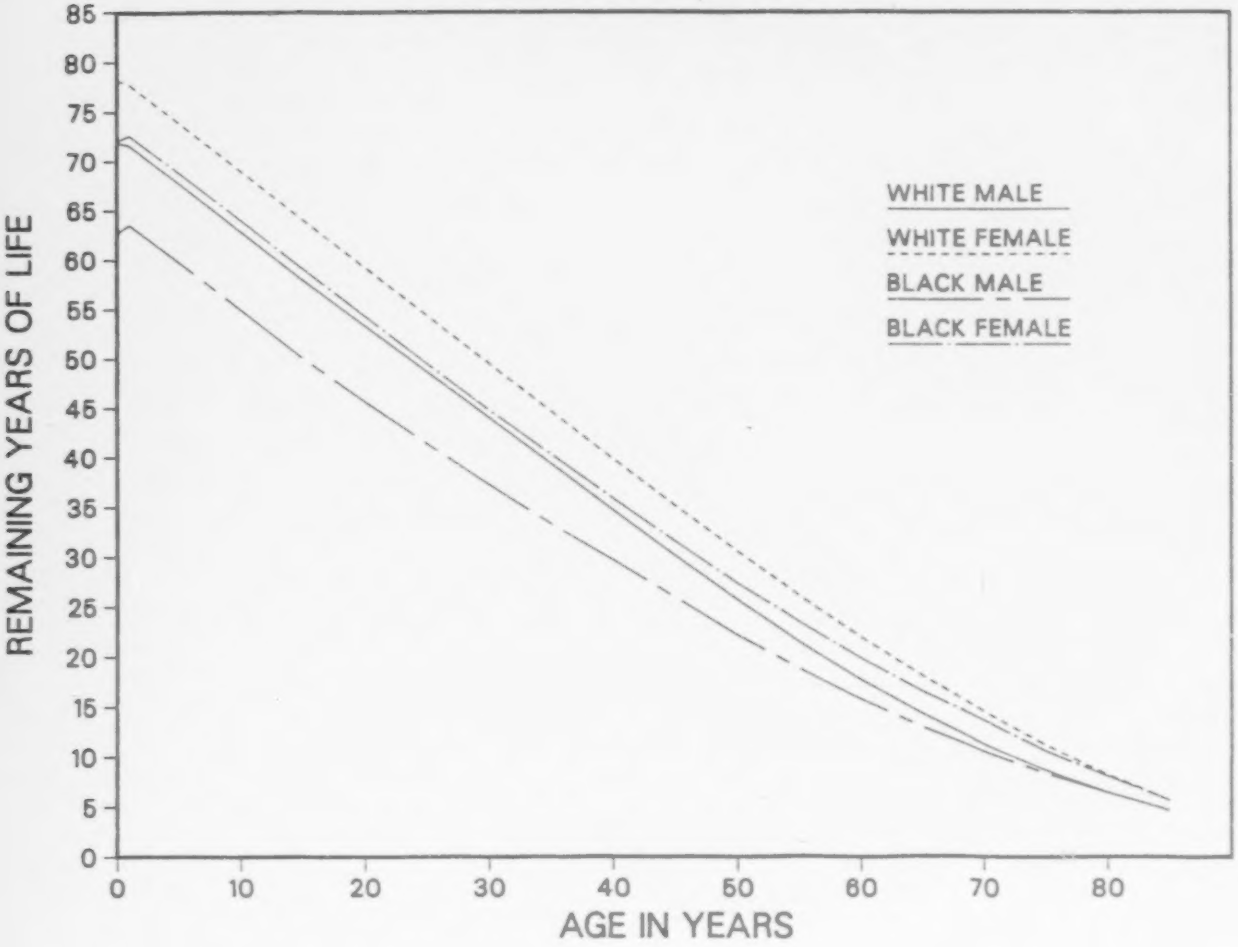
[2] Provisional

Table 2.73
Life Expectancy at Birth by Sex and Race, Michigan Residents, Selected Years, 1950-1986[1]

POPULATION SUBGROUP	YEAR									
	1950	1960	1970	1980	1981	1982	1983	1984	1985	1986
Total Population	68.3	70.0	70.8	73.4	73.7	74.0	74.1	74.1	74.0	74.1
Total Male	65.7	67.1	67.2	70.0	70.3	70.6	70.7	70.8	70.6	70.7
Total Female	71.2	73.3	74.6	76.9	77.1	77.4	77.4	77.2	77.4	77.4
Total White	68.8	70.5	71.6	74.3	74.4	74.8	74.9	75.0	74.9	75.1
White Male	66.2	67.5	68.2	71.0	71.1	71.5	71.6	71.8	71.7	71.9
White Female	71.9	74.0	75.3	77.6	77.7	78.0	78.1	78.0	78.1	78.2
Total All Other	61.8	65.6	65.0	68.5	69.3	69.6	69.5	68.9	68.6	68.2
All Other Male	60.4	63.6	61.0	64.3	65.2	65.3	65.3	64.7	64.0	63.8
All Other Female	63.4	67.7	69.4	72.7	73.4	73.8	73.7	73.0	73.2	72.7

[1] Data for 1980-1982 have been revised.

FIGURE 2.51
REMAINING YEARS OF LIFE BY AGE, SEX, AND RACE, MICHIGAN RESIDENTS, 1986



PLACE OF OCCURRENCE

There were 2,257 Michigan resident deaths in 1986 that occurred outside the state. This represents 2.8 percent of all resident deaths. Of the 2,257 deaths among Michigan residents 479 (21.2 percent) occurred in the state of Ohio, more than in any other state. The state with the second highest number of Michigan resident deaths was Florida with 19.8 percent (446 deaths). The border areas of Illinois, Indiana, Ohio, Wisconsin, and Canada accounted for 49.0 percent of all resident deaths outside Michigan. In addition to the above-mentioned areas, over 50 Michigan resident deaths occurred in each of the following states: California, Texas, Arizona and Minnesota. Michigan resident deaths occurred in 47 of the 50 states in 1986, the District of Columbia, Puerto Rico and Canada (Table 2.74).

Of the 1,131 non-residents that died in Michigan in 1986, 47.6 percent were from the border areas while 20.9 percent were Floridians. Overall, non-residents who died in Michigan were residents of 45 states, the District of Columbia and at least seven foreign countries.

Table 2.74

Michigan Resident Deaths Occurring Outside Michigan by Place of Occurrence and Deaths Occurring in Michigan to Non - Michigan Residents by Place of Residence, 1986

GEOGRAPHIC AREA	DEATHS OF RESIDENTS OCCURRING OUTSIDE MICHIGAN		DEATHS OF NONRESIDENTS OCCURRING IN MICHIGAN	
	NUMBER	PERCENT	NUMBER	PERCENT
Total	2,257	100.0	1,131	100.0
Ohio	479	21.2	152	13.4
Florida	446	19.8	236	20.9
Indiana	299	13.2	89	7.9
Wisconsin	234	10.4	163	14.4
Illinois	94	4.2	105	9.3
Minnesota	75	3.3	7	0.6
California	73	3.2	34	3.0
Texas	62	2.7	33	2.9
Arizona	61	2.7	20	1.8
Tennessee	26	1.2	16	1.4
New York	23	1.0	31	2.7
Canada	1	0.0	29	2.6
Other Areas	384	17.0	216	19.1

MARRIAGE & DIVORCE

SECTION III

MARRIAGE AND DIVORCE: AN OVERVIEW 1986

TOTAL MARRIAGES	77,815
TOTAL DIVORCES AND ANNULMENTS	39,553
MARRIAGE RATE[1]	17.0
DIVORCE RATE[1]	8.7
MEDIAN AGE OF THE BRIDE	25
MEDIAN AGE OF THE GROOM	27

[1] Number of persons married or divorced per 1,000 population.

MARRIAGES AND DIVORCES

The number of marriages and divorces occurring in Michigan has increased considerably since 1900. While the frequency of marriage has generally followed the growth of Michigan's population, the rate of persons dissolving their marriages has increased over fourfold since 1900.

The smallest number of marriages in the years 1900 to 1986 was 23,295 in 1900, while the largest number was 94,486 in 1973. After steep declines in the number of marriages in 1974 and 1975 and a smaller decline in 1976, the number of marriages increased during each of the following three years. In 1980 through 1983 the number of marriages declined. The number of marriages increased in 1984 and decreased in both 1985 and 1986. The number of marriages recorded in 1986 was 77,815, the lowest number since 1964. The number of divorces and annulments increased from a low of 2,435 in 1900 to a high of 45,047 in 1980. In 1986 the number of divorces and annulments was 39,553. This represents an increase of 2.0 percent from the figure for 1985.

MARRIAGES

Since 1900 there have been noticeable changes in the marriage rates both nationally and in Michigan (Figure 3.1). The marriage rates observed for the state have generally followed the pattern of rising and falling rates observed nationally. Strong historic shifts in rates have been related most notably to the factors of war and the economy. The highest rates observed during this century were for the years immediately following the end of the two World Wars (27.7 in 1920 and 27.6 in 1946). The lowest rates occurred during the Great Depression of the 1930's.

The number of persons married each year per 1,000 population was higher in Michigan than in the country for 19 of the 26 years from 1900 through 1925. Since 1926, Michigan's marriage rate has been lower than that of the nation, excepting only the years 1964 through 1969.

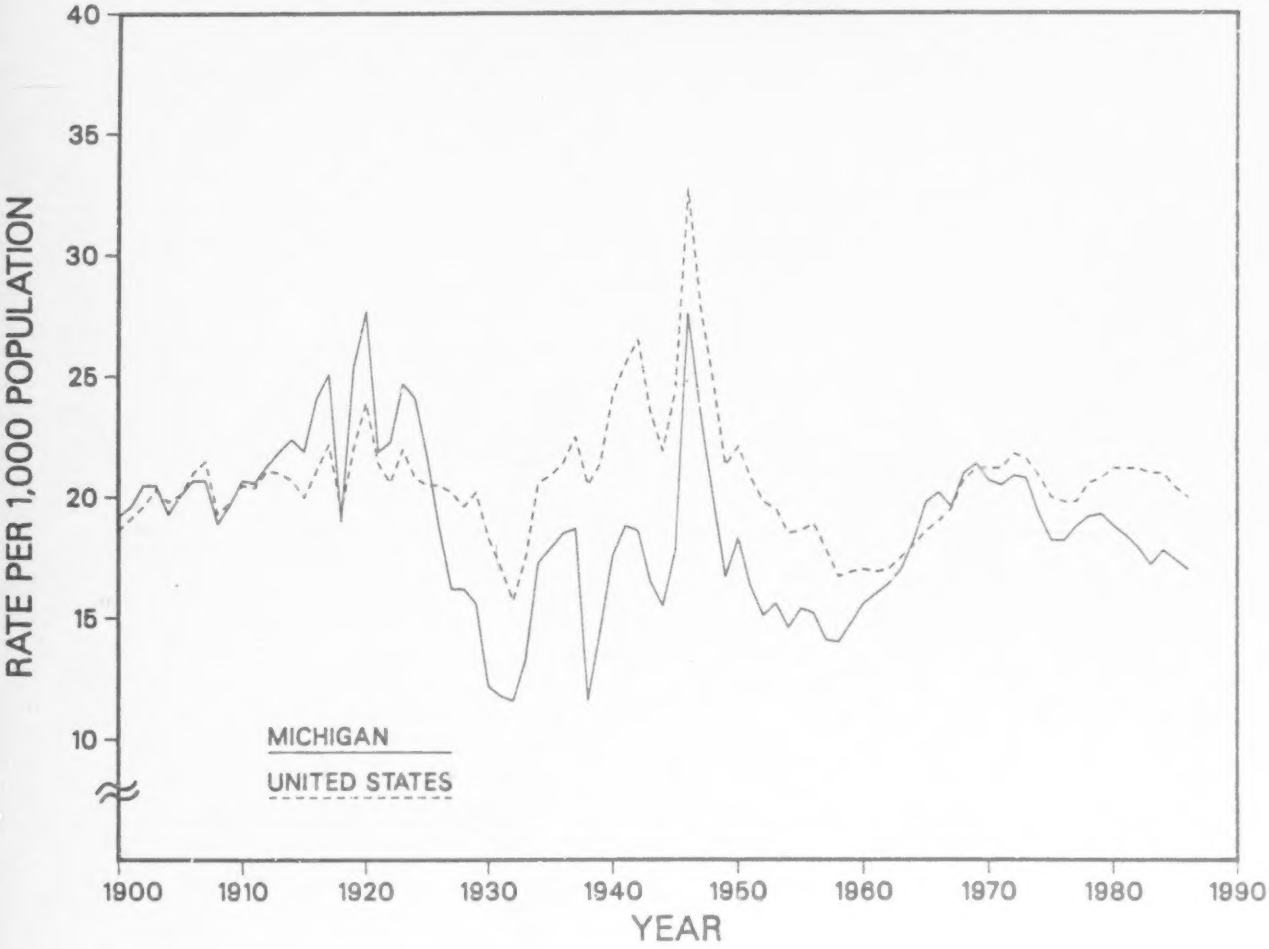
The gap between the marriage rate for Michigan and that for the nation has increased in recent years. In 1977 the United States rate (including nonlicensed marriages registered in California) was 6.9 percent above that of Michigan. By 1980, this percent increased to 12.8 and in 1986 the provisional rate for the nation was 17.6 percent above Michigan's rate.

The marriage rate for Michigan in 1986 was 17.0, 2.4 percent lower than the 1985 rate of 17.4 (Table 3.1). The provisional rate for the nation in 1986 was 20.0.

RESIDENCE OF COUPLES MARRYING IN MICHIGAN

When presenting statistics of births, deaths and fetal deaths it is possible to provide total resident figures due to an interstate agreement for exchange of nonresident event information. Thus, should a Michigan resident give birth in some other state, the state will forward the information to Michigan. No such agreement exists for marriages. This is an important consideration when analyzing marriage statistics. The marriage data presented are drawn from all marriages performed in

FIGURE 3.1
MARRIAGE RATES, MICHIGAN AND UNITED STATES OCCURRENCES, 1900-1986[1]



[1] United States rate for 1986 is provisional.

Table 3.1
Marriages and Marriage Rates[1], Michigan and United States Occurrences, Selected Years, 1920-1986

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
1,274,476	23.9	1920	50,805	27.7
1,126,856	18.3	1930	29,482	12.2
1,595,879	24.2	1940	46,342	17.6
1,667,231	22.1	1950	58,180	18.3
1,523,000	17.0	1960	61,090	15.6
1,548,000	16.9	1961	63,320	16.0
1,577,000	17.0	1962	65,002	16.4
1,654,000	17.5	1963	68,160	17.0
1,725,000	18.0	1964	73,911	18.2
1,800,000	18.6	1965	81,247	19.8
1,857,000	19.0	1966	83,903	20.2
1,927,000	19.5	1967	84,363	19.6
2,069,000	20.7	1968	90,984	21.0
2,145,000	21.2	1969	93,392	21.4
2,158,802	21.2	1970	91,933	20.7
2,190,481	21.2	1971	92,134	20.5
2,282,154	21.8	1972	94,447	20.9
2,284,108	21.6	1973	94,486	20.8
2,229,667	20.9	1974	88,023	19.3
2,152,662	20.0	1975	82,856	18.2
2,154,807	19.8	1976	82,753	18.2
2,178,367	19.8	1977	86,088	18.8
2,282,272	20.6	1978[2]	88,333	19.2
2,331,337	20.8	1979	89,450	19.3
2,390,252	21.2	1980	86,898	18.8
2,422,145	21.2	1981	85,252	18.4
2,456,278	21.2	1982	82,633	17.9
2,445,604	21.0	1983	78,910	17.2
2,477,000	21.0	1984	80,810	17.8
2,425,000	20.4	1985	79,022	17.4
2,400,000Pr.	20.0Pr.	1986	77,815	17.0

[1] Number of persons married per 1,000 population.

[2] Beginning with 1978, marriage data for the United States include nonlicensed marriages registered in California. If nonlicensed marriages were included in the 1977 total, the marriage rate would increase from 19.8 to 20.1.

the state regardless of the couple's residence.

Table 3.2 indicates that, in general, most of the couples marrying in Michigan are residents of the state. For marriages occurring in Michigan in 1986 95.8 percent of the brides were residents of Michigan, while 93.1 percent of the grooms were residents of the state. These figures are slightly lower than those for marriages occurring in Michigan in 1976. Over the decade the proportion of marriages where both the bride and groom are not residents has increased slightly. These data indicate that the general characteristics of marriages occurring in Michigan should be representative of marriage patterns for Michigan residents.

There were a total of 3,290 non-resident brides married in Michigan in 1986. The figure for grooms is considerably greater than that of brides, numbering 5,419. Table 3.3 shows the most frequent residences of non-resident brides and grooms married in Michigan. The nearby states of Illinois, Indiana, Ohio and Wisconsin are the states of residence for 31.5 percent of all non-resident grooms and 36.0 percent of non-resident brides.

MONTH OF MARRIAGE

The number of marriages occurring in Michigan varies with the seasons. The most popular months for marriages in 1986 were June and August, with 9,797 and 10,914 marriage ceremonies being performed during these months respectively. May was also a popular choice, with 11.2 percent of all marriages being performed in this month. Fewer marriages occurred during the winter months. The lowest figure was for January, with 23.5 percent of the number which occurred in August (Table 3.4).

AGE AT MARRIAGE

Examination of the data in Table 3.5 reveals that females generally marry at a younger age than do males. The number of females who

Table 3.2

Marriages by Residence Status of Bride and Groom, Michigan Occurrences, 1976 and 1986

RESIDENCE STATUS	1976		1986	
	NUMBER	PERCENT	NUMBER	PERCENT
Both Bride and Groom Residents	77,744	93.9	71,809	92.3
Bride Resident, Groom Non-Resident	2,974	3.6	2,714	3.5
Groom Resident, Bride Non-Resident	645	0.8	585	0.8
Both Bride and Groom Non-Resident	1,390	1.7	2,705	3.5
Residence Status, Not Stated	-	-	2	0.0
Total	82,753	100.0	77,815	100.0

Table 3.3
Place of Residence of Non - Resident Brides and Grooms, Marriages Occurring in Michigan, 1986

GEOGRAPHIC AREA	NON - RESI- DENT BRIDE	NON - RESIDENT GROOM
Arizona	62	94
California	332	548
Colorado	95	138
Florida	258	402
Georgia	68	142
Illinois	386	569
Indiana	289	422
Minnesota	71	110
New York	110	245
North Carolina	45	111
Ohio	308	452
Texas	267	407
Virginia	66	121
Wisconsin	201	264
Other U. S. Places	633	1,171
Foreign Countries	99	223
Total	3,290	5,421[1]

[1] Includes two cases with unknown residence.

Table 3.4
Marriages by Month, Michigan Occurrences, 1986

MONTH	NUMBER	PERCENT
January	2,563	3.3
February	3,885	5.0
March	3,752	4.8
April	5,408	6.9
May	8,687	11.2
June	9,797	12.6
July	7,378	9.5
August	10,914	14.0
September	8,199	10.5
October	7,410	9.5
November	4,983	6.4
December	4,839	6.2
January - December	77,815	100.0

marry before the age of 20 is 2.7 times the corresponding number of males. Between ages 20 and 24, 19.0 percent more brides than grooms married. Among persons 25 and over, males marry more frequently than females. In 1986 the median age of brides (25 years) marrying in Michigan was two years lower than the median age for grooms (27 years).

Since 1976, there have been significant declines in the marriage rate for persons of both sexes under the age of 25 years. The largest decline observed is for males under the age of 20 years for whom the marriage rate has dipped 58.6 percent. The comparable decline for females was 48.0 percent. The marriage rate declined by 36.2 percent and 11.6 percent respectively for males and females between the ages of 20 and 24. For

Table 3.5
Number of Marriages and Marriage Rates[1] by Age and Sex, Michigan Occurrences, 1976 and 1986

AGE IN YEARS	MALES			FEMALES		
	RATE 1976	NUMBER OF MARRIAGES 1986	RATE 1986	RATE 1976	NUMBER OF MARRIAGES 1986	RATE 1986
Under 20[2]	22.0	3,460	9.1	49.8	9,470	25.9
20 - 24	95.2	23,477	60.7	81.1	27,974	71.7
25 - 34	40.1	32,613	42.2	26.5	27,223	34.4
35 - 44	15.5	10,871	18.0	13.4	8,509	13.5
45 or Over	6.0	7,390	5.9	3.6	4,634	3.1
Not Stated	000	4	000	000	5	000
Total	18.5	77,815	17.5	17.9	77,815	16.6
Median Age at Last Birthday	000	27	000	000	25	000

[1] Number of persons married per 1,000 population.

[2] 15 - 19 population used to obtain rate.

persons of both sexes between the ages of 25 and 44 the rates of marriage have increased since 1976. The rates for persons 45 and over have dropped slightly.

The distribution of marriages by the age of bride and groom is shown in Table 3.6.

REMARRIAGES

Between 1976 and 1986 the percent of all marriages that were remarriages increased from 30.0 to 32.8 for brides and from 32.3 to 34.0 for grooms (Tables 3.7 and 3.8). The proportion of all marriages which are remarriages is displayed graphically in Figure 3.2 for the period 1960-1986. Between 1960 and 1965, the proportion of remarriages dropped. Since 1965, this proportion has increased. The increase in the period 1972 through 1975 was especially marked for both sexes.

The number of remarriages among females increased by 2.5 percent between 1976 and 1986, while the number of brides who had been married at least three times previously in-

Table 3.6
Marriages by Age of Bride and Age of Groom,
Michigan Occurrences, 1986

AGE OF GROOM	AGE OF BRIDE												
	TOTAL	UNDER 20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 AND OVER	NOT STATED
Total	77,815	9,470	27,974	18,018	9,205	5,472	3,037	1,788	932	645	547	356	366	5
Under 20	3,460	2,632	735	56	23	9	3	1	-	-	-	-	1	-
20-24	23,477	5,586	14,987	2,321	417	119	32	11	2	-	-	1	-	1
25-29	21,262	989	9,247	8,522	1,903	485	93	18	2	1	-	-	-	2
30-34	11,351	184	2,167	4,559	3,127	1,030	226	45	8	4	-	-	-	1
35-39	6,917	54	600	1,705	2,238	1,623	525	123	28	13	5	1	1	1
40-44	3,954	13	150	549	908	1,178	801	278	60	14	1	2	-	-
45-49	2,535	5	53	193	370	608	683	465	112	36	8	2	-	-
50-54	1,566	4	17	73	128	254	381	373	232	69	26	8	1	-
55-59	1,150	1	9	28	58	106	188	259	232	185	64	15	5	-
60-64	903	-	6	4	22	48	70	160	167	172	181	56	17	-
65-69	531	-	1	5	6	7	25	36	48	94	156	101	52	-
70 and Over	705	1	1	2	4	5	10	19	41	57	106	170	289	-
Not Stated	4	1	1	1	1	-	-	-	-	-	-	-	-	-

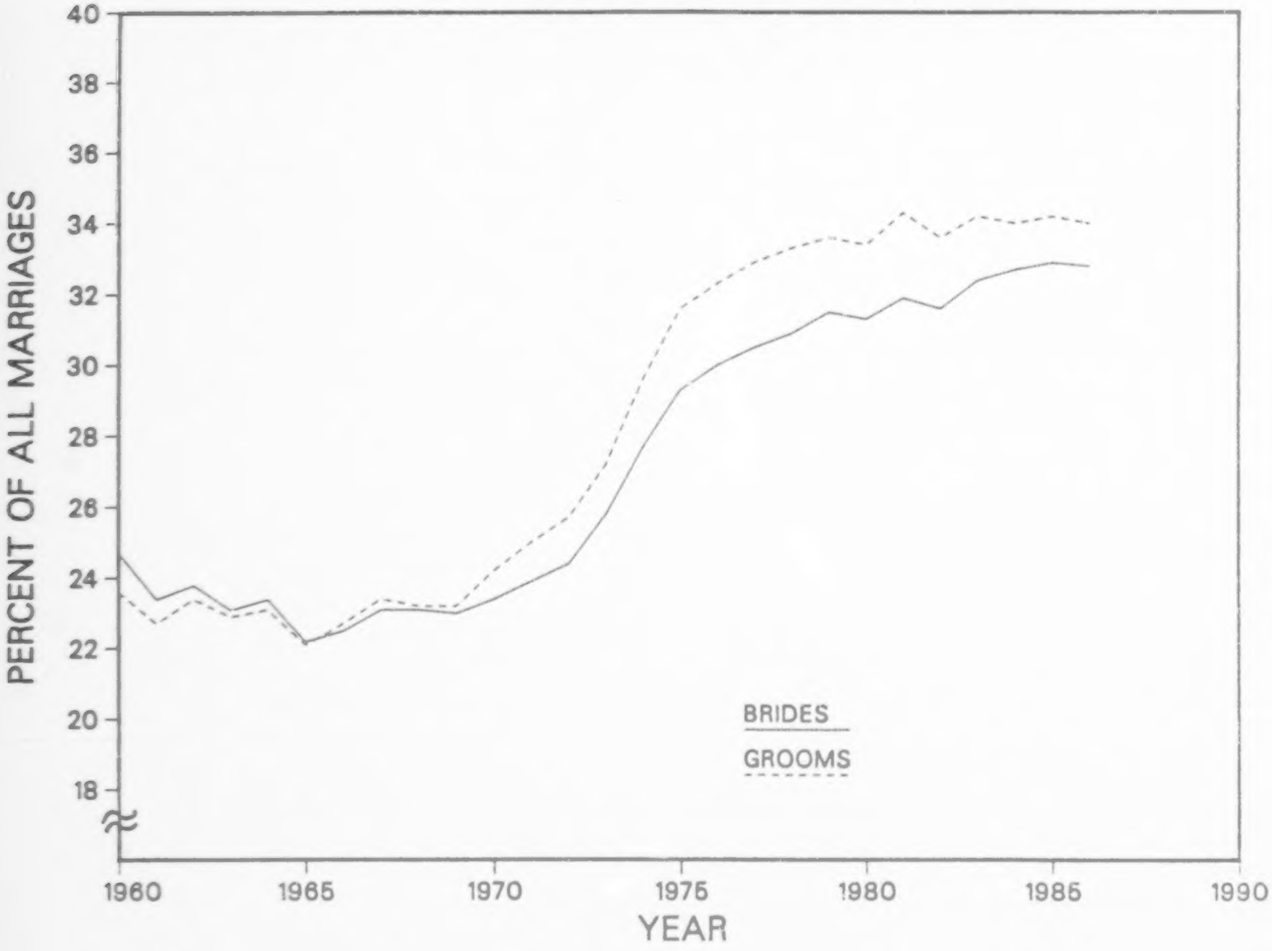
Table 3.7
Age at First Marriage and Remarriage: Bride
Michigan Occurrences, 1976 and 1986

AGES	1976				1986			
	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED
Under 20 . .	23,566	23,208	343	15	9,470	9,388	80	2
Percent . .	28.5	40.1	1.4	55.6	12.2	17.9	0.3	25.0
20-24	31,340	27,014	4,323	3	27,974	25,938	2,035	1
Percent . .	37.9	46.7	17.4	11.1	35.9	49.6	8.0	12.5
25-29	11,868	5,634	6,231	3	18,018	12,416	5,602	-
Percent . .	14.3	9.7	25.1	11.1	23.2	23.7	22.0	-
30-34	5,314	1,113	4,198	3	9,205	3,286	5,918	1
Percent . .	6.4	1.9	16.9	11.1	11.8	6.3	23.2	12.5
35-44	5,415	586	4,829	-	8,509	1,074	7,432	3
Percent . .	6.5	1.0	19.4	-	10.9	2.1	29.2	37.5
45 or Over .	5,246	303	4,940	3	4,634	208	4,425	1
Percent . .	6.3	0.5	19.9	11.1	6.0	0.4	17.4	12.5
Not Stated .	4	2	2	-	5	2	3	-
Percent . .	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Total	82,753	57,860	24,866	27	77,815	52,312	25,495	8
Percent . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Median Age at Last Birthday	22	21	31	19	25	23	34	30

Table 3.8
Age at First Marriage and Remarriage: Groom, Michigan Occurrences, 1976 and 1986

AGES	1976				1986			
	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED
Under 20 . .	10,244	10,206	28	10	3,460	3,454	5	1
Percent . .	12.4	18.2	0.1	41.7	4.4	6.7	0.0	12.5
20-24	33,261	30,961	2,294	6	23,477	22,700	775	2
Percent . .	40.2	55.3	8.6	25.0	30.2	44.2	2.9	25.0
25-29	16,973	10,916	6,056	1	21,262	17,298	3,962	2
Percent . .	20.5	19.5	22.6	4.2	27.3	33.7	15.0	25.0
30-34	7,330	2,288	5,041	1	11,351	5,658	5,692	1
Percent . .	8.9	4.1	18.8	4.2	14.6	11.0	21.5	12.5
35-44	7,177	1,008	6,168	1	10,871	1,897	8,974	-
Percent . .	8.7	1.8	23.0	4.2	14.0	3.7	33.9	-
45 or Over .	7,764	581	7,179	4	7,390	363	7,025	2
Percent . .	9.4	1.0	26.8	16.7	9.5	0.7	26.6	25.0
Not Stated .	4	2	1	1	4	2	2	1
Percent . .	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Total	82,753	55,962	26,767	24	77,815	51,372	26,435	8
Percent . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Median Age at Last Birthday	24	22	34	20	27	24	37	27

FIGURE 3.2
PERCENT OF ALL MARRIAGES THAT ARE REMARRIAGES,
MICHIGAN OCCURRENCES, 1960-1986



creased by 18.3 percent. Total remarriages for grooms decreased by 1.2 percent and third or higher order marriages increased in frequency by 19.5 percent between 1976 and 1986 (Tables 3.9 and 3.10).

As remarriages can only occur when a prior marriage has been terminated by a divorce, an annulment or the death of a spouse, it is apparent that persons remarrying will be generally older. Tables 3.9 and 3.10 demonstrate that the order of marriage has a strong positive relationship with the age of both brides and grooms. Note, however, the upward shift between 1976 and 1986 in the age distribution for third and lower order marriages for brides.

The median age of brides at marriage for first and second marriages increased by two years during this period. For third marriages the median age increased one year, while for fourth and higher order marriages the median age for brides remained the same. For grooms the median age increased two years for first marriages, three years for second marriages and stayed the same for third and higher order marriages.

Changes in the frequency of remarriages have varied substantially in different age groups. Among persons under age 25 the number of remarriages declined between 1976 and 1986 by 54.7 percent for females and 62.1 percent for males. The number of brides between ages 25 and 29 who had previously been married decreased by 10.1 percent between 1976 and 1986, while that of grooms declined 34.6 percent.

The greatest relative increase in numbers of remarriages for females and males occurred in the age group 35-44 years. The numbers of remarriages increased 53.9 percent for females and 45.5 percent for males. For females and males 45 and over the number of remarriages declined.

The most frequent age interval for remarriage among males was 45 years of age or older in 1976 and 35-44 years of age in 1986 (Table 3.7 and 3.8). Among females in 1976 the most frequent age interval for remarriage was 25-29 years of age. It was 35-44 years of age in 1986.

FIRST MARRIAGES

First marriages are an interesting component of all marriages in that they constitute an event that can never be duplicated. The frequency of first marriages can not be directly affected by rates of divorce or deaths to married persons and as such reflects the propensity of the population as a whole to enter into marital agreements.

There has been an increase followed by a decline in both the number and rate of first marriages between 1976 and 1986. Over the eleven years the number of first marriages dropped 9.6 percent for women and 8.2 percent for men. The rate of first marriages dropped by 10.5 percent for women and 8.7 percent for men. For men and women, the number and rate of first marriages increased between 1976 and 1979, fell in the years 1980 through 1983, increased or remained the same in 1984 and decreased again in 1985 and 1986 (Tables 3.11, 3.12, 3.13 and 3.14).

Changes in the frequency of first marriages have varied in different age groups. The greatest decline in first marriages occurred in the under 20 age group for both brides and

Table 3.9
Remarriages of Brides by Age and Order of Marriage, Michigan Occurrences, 1976 and 1986

AGES	1976				1986			
	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES
All Ages . . .	82,753	19,871	4,101	894	77,815	19.586	4,728	1,181
Under 20 . . .	23,566	341	2	-	9,470	78	2	-
20-24	31,340	4,103	211	9	27,974	1,967	65	3
25-29	11,868	5,385	770	76	18,018	4,976	562	64
30-34	5,314	3,279	785	134	9,205	4,721	1,033	164
35-39	3,253	2,057	636	179	5,472	3,202	1,124	288
40-44	2,162	1,352	460	145	3,037	1.789	774	255
45 or Over . .	5,246	3,352	1,237	351	4,634	2,851	1,167	407
Not Stated . .	4	2	-	-	5	2	1	-
Median Age at Last Birthday	22	30	37	41	25	32	38	41

Table 3.10
Remarriages of Grooms by Age and Order of Marriage, Michigan Occurrences, 1976 and 1986

AGES	1976				1986			
	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES
All Ages	82,753	21,562	4,315	890	77,815	20,214	4,995	1,226
Under 20	10,244	28	-	-	3,460	5	-	-
20-24	33,261	2,238	55	1	23,477	761	14	-
25-29	16,973	5,566	458	32	21,262	3,720	233	9
30-34	7,330	4,209	735	97	11,351	4,788	816	88
35-39	4,281	2,726	754	135	6,917	4,034	1,155	224
40-44	2,896	1,836	579	138	3,954	2,343	931	287
45 or Over	7,764	4,959	1,734	487	7,390	4,561	1,846	618
Not Stated	4	-	-	1	4	2	-	-
Median Age at Last Birthday	24	33	41	45	27	36	41	45

Table 3.11
First Marriages by Age of Bride, Michigan Occurrences, 1976-1986

AGE OF BRIDE	YEAR										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
All Ages	57,860	59,832	60,956	61,281	59,656	58,006	54,746	53,282	54,372	52,994	52,312
15-19 Years[1]	23,208	22,341	20,858	19,531	17,541	15,723	13,884	12,657	11,465	10,133	9,388
20-24 Years	27,014	28,893	30,356	31,260	30,620	29,931	28,100	26,934	27,945	26,872	25,938
25-29 Years	5,634	6,348	7,412	8,059	8,895	9,466	9,776	10,331	11,174	11,764	12,416
30-34 Years	1,113	1,377	1,469	1,595	1,781	2,029	2,117	2,428	2,752	3,059	3,286
35-39 Years	381	385	418	402	415	449	488	558	651	713	856
40-44 Years	205	173	165	166	160	160	166	167	187	211	218
45-49 Years	126	118	104	110	95	82	73	88	69	95	91
50 or Over	177	197	173	156	149	165	138	116	127	145	114
Not Stated	2	-	1	2	-	1	4	3	2	2	2

[1] Brides under age 15 included in age 15-19.

Table 3.12
First Marriages by Age of Groom, Michigan Occurrences, 1976-1986

AGE OF GROOM	YEAR										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
All Ages	55,962	57,737	58,806	59,356	57,840	56,017	53,134	51,891	53,293	52,004	51,372
15-19 Years[1]	10,206	9,481	8,267	7,906	6,810	6,070	5,309	4,794	4,330	3,706	3,454
20-24 Years	30,961	32,269	32,900	32,501	31,256	29,698	27,303	25,467	25,374	23,972	22,700
25-29 Years	10,916	11,706	13,026	13,924	14,654	14,834	14,887	15,544	16,455	16,869	17,298
30-34 Years	2,288	2,653	2,996	3,360	3,580	3,790	4,025	4,286	5,147	5,201	5,658
35-39 Years	665	747	797	837	816	879	956	1,074	1,228	1,456	1,504
40-44 Years	343	324	297	332	292	279	280	321	352	386	393
45-49 Years	226	198	183	160	170	167	137	152	140	164	152
50 or Over	355	358	340	335	262	297	237	246	263	247	211
Not Stated	2	1	-	1	-	3	-	7	4	3	2

[1] Grooms under age 15 included in age 15-19.

Table 3.13
First Marriage Rates[1] by Age of Bride, Michigan Occurrences, 1976-1986

AGE OF BRIDE	YEAR										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
All Ages	12.4	12.8	12.9	12.9	12.6	12.7	11.9	11.7	11.7	11.4	11.1
15-19 Years[2]	52.5	50.4	46.9	43.8	39.3	43.9	40.8	39.2	30.5	27.3	25.7
20-24 Years	63.9	67.1	69.1	69.8	67.6	77.0	74.8	74.3	69.6	68.0	66.5
25-29 Years	15.4	16.8	19.1	20.1	21.8	22.9	23.6	24.9	27.1	28.8	30.6
30-34 Years	3.5	4.2	4.3	4.5	4.9	5.4	5.6	6.3	7.4	8.1	8.5
35-39 Years	1.4	1.4	1.5	1.4	1.4	1.3	1.4	1.6	2.0	2.1	2.5
40-44 Years	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.8	0.8
45-49 Years	0.5	0.5	0.4	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.4
50 or Over	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

[1] Number of persons married per 1,000 population.

[2] Brides under 15 included in age 15-19.

Table 3.14
First Marriage Rates[1] by Age of Groom, Michigan Occurrences, 1976-1986

AGE OF GROOM	YEAR										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
All Ages	12.6	12.9	13.1	13.2	12.8	12.8	12.3	12.1	12.3	11.8	11.5
15-19 Years	22.8	21.1	18.3	17.4	15.0	16.4	15.1	14.3	12.3	9.7	9.1
20-24 Years	77.7	78.8	78.1	75.0	70.8	78.6	74.7	72.2	69.5	61.7	58.7
25-29 Years	30.4	31.7	34.2	35.5	36.7	36.7	36.8	38.3	40.6	42.2	43.6
30-34 Years	7.5	8.4	9.1	9.9	10.3	10.3	10.8	11.4	13.9	14.0	15.1
35-39 Years	2.6	2.8	3.0	3.0	2.9	2.7	2.9	3.2	3.7	4.5	4.5
40-44 Years	1.4	1.4	1.3	1.4	1.3	1.1	1.1	1.2	1.3	1.5	1.4
45-49 Years	1.0	0.9	0.8	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7
50 or Over	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2

[1] Number of persons married per 1,000 population.

grooms, and the decline has been consistent over the period 1976-1986. The number of first marriages in the under 20 age group dropped by 59.5 percent for brides and by 66.2 percent for grooms between 1976 and 1986 while the corresponding rate of first marriages dropped 51.0 percent for brides and 60.1 percent for grooms. The number and rate of first marriages also declined substantially for grooms in the 20-24 year age group.

There were significant increases in the number and rate of first marriages of both brides and grooms between ages 25 and 39. Between 1976 and 1986 the number of first marriages increased by 58.5 percent, 147.3 percent, 126.2 percent and 14.6 percent for grooms aged 25-29, 30-34, 35-39 and 40-44 years respectively. For brides the comparable figures were 120.4 percent, 195.2 percent, 124.7 percent and 6.3 percent. Since 1976 the number of first marriages has declined for persons aged 45 or over.

MEDIAN AGE AT FIRST MARRIAGE

The median age at first marriage declined for both brides and grooms between 1953 and the mid-1960's. This decline was greater for males than for females. Grooms were 34 months older than brides at the median in 1953, 23 months older in 1963 and 20 months older in 1968. During the past fifteen years, the median age at first marriage has increased by about the same amount for both males and females. Grooms were 21 months older than brides at the median in 1986.

The median age at first marriage in 1986 was 23 years 2 months for brides and 24 years 11 months for grooms. The 1986 figures are the highest median ages at first marriage recorded during the period 1953-1986 (Figure 3.3).

DIVORCES AND ANNULMENTS

The number of reported divorces and annulments reached a record high in 1980, both in Michigan and the nation (Table 3.15). In 1981, the frequency for Michigan declined while the national figure reached another record high. Between 1980 and 1984, the Michigan frequency declined. The number then increased to 39,553 in 1986. The 1986 frequency was 12.2 percent below the 1980 frequency and 2.0 percent greater than the 1985 frequency. Nationally, the number of divorces declined in 1986 to 4.5 percent below the record high figure set in 1981.

The number of divorces and annulments reported for Michigan in 1986 was 2.4 times the number for 1960. Between 1960 and 1970 the number of divorces and annulments increased by 80.0 percent. Between 1970 and 1975 the number of divorces and annulments increased by 36.0 percent, and from 1975 to 1980 the increase was 10.0 percent. During the latter period the first annual declines since 1963 occurred. The number of divorces and annulments declined steadily between 1980 and 1984, then increased again. In 1985 the number of divorces and annulments increased.

The number of persons divorced in Michigan per thousand population generally increased from 2.0 in 1900 to the then century high of 5.1 in 1929, then declined between 1930 and 1933 to 3.1. Between 1934 and 1946 the rate generally increased, peaking at 10.2 in 1946. The rate of divorces and annulments decreased to 3.6 in 1958, increased to a high

FIGURE 3.3
MEDIAN AGE AT FIRST MARRIAGE BY SEX, MICHIGAN OCCURRENCES, 1953-1986

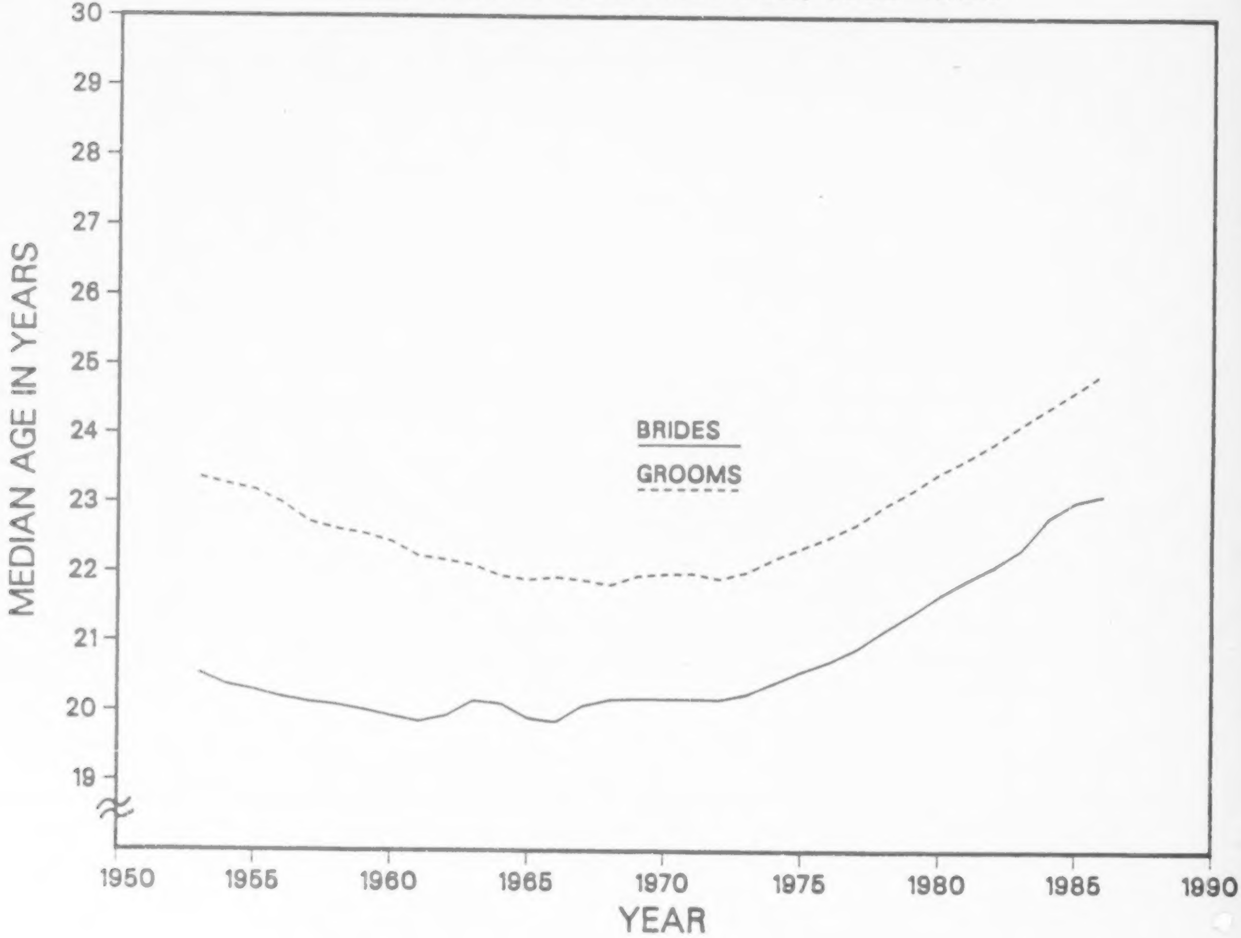


Table 3.15
Number of Divorces and Annulments, and Divorce and Annulment Rates[1], Michigan and United States Occurrences, Selected Years, 1920-1986

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
170,505	3.2	1920	8,679	4.7
195,961	3.2	1930	10,639	4.4
264,000	4.0	1940	12,054	4.6
385,144	5.1	1950	15,979	5.0
393,000	4.4	1960	16,656	4.0
414,000	4.5	1961	16,219	4.1
413,000	4.4	1962	17,500	4.4
428,000	4.5	1963	17,479	4.4
450,000	4.7	1964	19,400	4.8
479,000	4.9	1965	20,305	5.0
499,000	5.1	1966	21,727	5.2
523,000	5.3	1967	23,620	5.5
584,000	5.8	1968	25,400	5.9
639,000	6.3	1969	28,347	6.5
708,000	7.0	1970	29,934	6.7
773,000	7.5	1971	31,790	7.1
845,000	8.1	1972	35,505	7.9
915,000	8.7	1973	37,128	8.2
977,000	9.2	1974	39,940[2]	8.8[2]
1,036,000	9.6	1975	40,782	9.0
1,083,000	10.0	1976	43,101	9.5
1,091,000	9.9	1977	43,036	9.4
1,130,000	10.2	1978	45,029	9.8
1,181,000	10.5	1979	44,242	9.6
1,189,000	10.5	1980	45,047	9.7
1,213,000	10.6	1981	43,167	9.3
1,170,000	10.0	1982	39,739	8.6
1,158,000	9.8	1983	37,991	8.3
1,169,000	10.0	1984	37,563	8.3
1,190,000	10.0	1985	38,775	8.5
1,159,000Pr.	9.6Pr.	1986	39,553	8.7

[1] Number of persons whose marriages ended in divorce or annulment per 1,000 population.

[2] Estimate.

of 9.8 in 1978, decreased to 8.3 in 1983 and increased to 8.7 in 1986.

The national rate of 9.6 in 1986. Michigan's divorce rate was higher than that for the United States each year from 1900 through 1947. In the following 39 years the Michigan divorce rate has been at or below the national rate 32 times, including each of the past 17 years (Table 3.15 and Figure 3.4). The lowest national rate was 1.5 in 1900. The highest national divorce rate during this century was recorded in 1979 (10.6).

The number of children under 18 of couples dissolving marriages in 1986 was at least 39,378 (Table 3.16). This is 19.9 percent below the number in 1976. The number of children affected by divorce has however increased as a proportion of all children. This ratio increased from 6.5 per 1,000 Michigan children in 1960 to 12.5 in 1970 and to 17.0 by 1978 (Table 3.17). The rate was stable between 1978 and 1980. It declined to 14.8 in 1984 and increased to 15.7 in 1986.

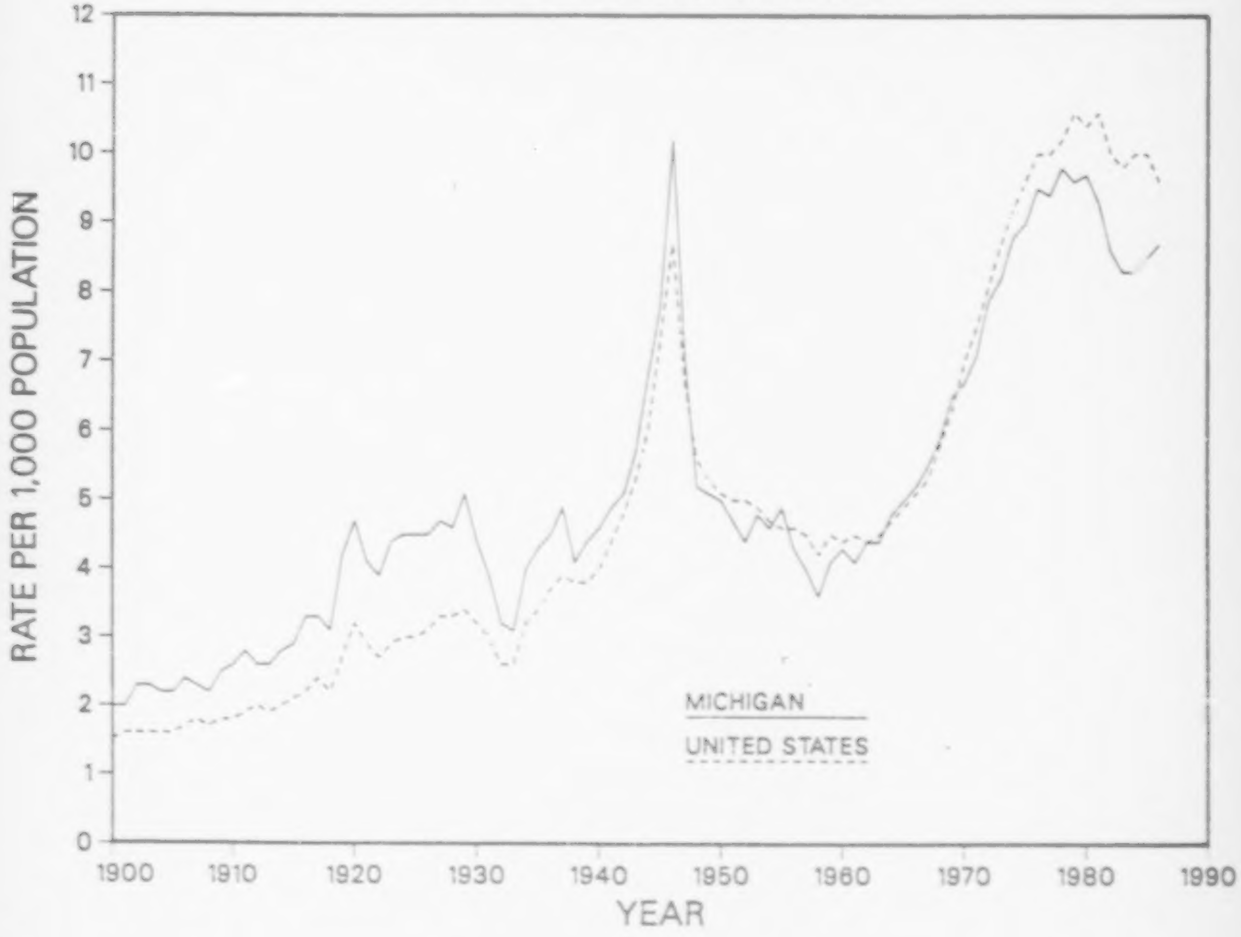
The average number of children per divorce has, nonetheless, dropped from 1.36 children in 1970 to 1.00 in 1986. The decline primarily reflects a decline in the proportion of divorces involving three or more children. It should be noted that Michigan live birth data indicate that there has been a decline in the relative proportion of women having third or

Table 3.16
Divorces and Annulments by Children Under 18 Present,
Michigan Occurrences, 1976 and 1986

NUMBER OF CHILDREN	DIVORCES AND ANNULMENTS				ESTIMATED TOTAL CHILDREN (MINIMUM)[1]	
	NUMBER		PERCENT			
	1976	1986	1976	1986	1976	1986
Zero	17,589	14,407	40.8	36.4	000	000
One	10,469	9,630	24.3	24.3	10,469	9,630
Two	8,729	8,827	20.2	22.3	17,458	17,654
Three	3,787	2,836	8.8	7.2	11,361	8,508
Four	1,527	659	3.5	1.7	6,108	2,636
Five or More	757	175	1.8	0.4	3,785	950
Not Stated	243	3,019	0.6	7.6	000	000
Total	43,101	39,553	100.0	100.0	49,181	39,378

[1] Total children for marriages involving 6 or more children under 18 is not available.

FIGURE 3.4
DIVORCE RATES, MICHIGAN AND UNITED STATES[1]
OCCURRENCES, 1900-1986



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[1] United States rate for 1986 is provisional.

Table 3.17
Estimated Number of Children Involved in Divorces and Annulments, Average Number of Children Per Decree, and Rate per 1,000 Children Under 18 Years of Age, Michigan and the United States, Selected Years 1960-1986

MICHIGAN				UNITED STATES		
Estimated Number of Children Involved	Average Number of Children Per Decree	Rate per 1,000 Under 18 Years of Age	Year	Estimated Number of Children Involved	Average Number of Children Per Decree	Rate per 1,000 Under 18 Years of Age
19,209	1.15	6.5	1960	463,000	1.18	7.2
40,596	1.36	12.5	1970	870,000	1.22	12.5
43,430	1.37	13.4	1971	946,000	1.22	13.6
46,538	1.31	14.4	1972	1,021,000	1.20	14.7
48,153	1.18	15.8	1975	1,123,000	1.08	16.7
49,555	1.15	16.6	1976	1,117,000	1.03	16.9
47,569	1.11	16.3	1977	1,095,000	1.00	16.7
48,510	1.08	17.0	1978	1,147,000	1.01	17.7
47,019	1.07	16.8	1979	1,181,000	1.00	18.4
46,603	1.04	16.9	1980	1,174,000	0.98	17.3
45,461	1.05	18.2	1981	1,180,000	0.97	18.7
41,156	1.04	16.9	1982	1,108,000	0.94	17.6
38,712	1.02	16.2	1983	1,091,000	0.94	17.4
37,629	1.00	14.8	1984	1,081,000	0.92	17.2
38,673	1.00	15.3	1985	1,091,000	0.92	17.3
39,378	1.00	15.7	1986[1]	---	---	---

[1] There were 3,019 records on which the number of children under 18 years of age was not stated, compared to 2,362 in 1985.

higher order live births over the past decade. Data for the United States indicate a similar pattern.

The majority of husbands and wives divorced in 1986 in Michigan were from 25 to 39 years of age (Table 3.18). The median age for husbands was 34 years and 9 months, while the median age for wives was 30 months younger (32 years and 3 months). Fourteen percent of the wives were under 25 years of age compared to only 7.6 percent of the husbands. Conversely, 5.5 percent of the wives were 50 years of age or over compared to 9.2 percent of the husbands.

In 10.2 percent of the marriages dissolved in Michigan in 1986 the couple separated less than one year after the marriage took place. In 42.5 percent of the marriages ended by divorce or annulment the separation took place within five years of the date of marriage (Table 3.19). The median duration of marriage at the time of dissolution was 7 years

Table 3.18

Divorces and Annulments by Age of Husband and Wife at Time of Decree

Michigan Occurrences, 1986

AGE	HUSBAND		WIFE	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Total	39,553	100.0	39,553	100.0
Under 20	88	0.2	404	1.0
20 - 24	2,916	7.4	5,124	13.0
25 - 29	7,186	18.2	8,014	20.3
30 - 34	7,279	18.4	7,063	17.9
35 - 39	6,312	16.0	5,673	14.3
40 - 44	4,379	11.1	3,615	9.1
45 - 49	2,625	6.6	1,950	4.9
50 - 54	1,570	4.0	975	2.5
55 - 59	973	2.5	596	1.5
60 - 64	585	1.5	309	0.8
65 - 69	264	0.7	170	0.4
70 - 74	133	0.3	72	0.2
75 +	84	0.2	40	0.1
Unknown	5,159	13.0	5,548	14.0
Median Age	34 Years 9 Months	000	32 Years 3 Months	000

[1] Based on records with known age only.

Table 3.19
Divorces and Annulments by Duration of Marriage at Time of Separation and at Time of Dissolution, Michigan Occurrences, 1986

DURATION IN YEARS	AT TIME OF SEPARATION		AT TIME OF DISSOLUTION	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Less Than 1	4,031	10.2	1,160	2.9
1 - 4	12,785	32.3	12,357	31.2
5 - 9	8,243	20.8	10,779	27.3
10 - 14	4,765	12.0	6,035	15.3
15 - 19	3,141	7.9	4,156	10.5
20 - 24	1,676	4.2	2,412	6.1
25 - 29	824	2.1	1,253	3.2
30 - 34	380	1.0	653	1.7
35 - 39	165	0.4	319	0.8
40 - 44	50	0.1	128	0.3
45 - 49	13	0.0	44	0.1
50 +	6	0.0	15	0.0
Unknown	3,474	8.8	242	0.6
Total	39,553	100.0	39,553	100.0
Median Duration	5 Years 6 Months	000	7 Years 3 Months	000

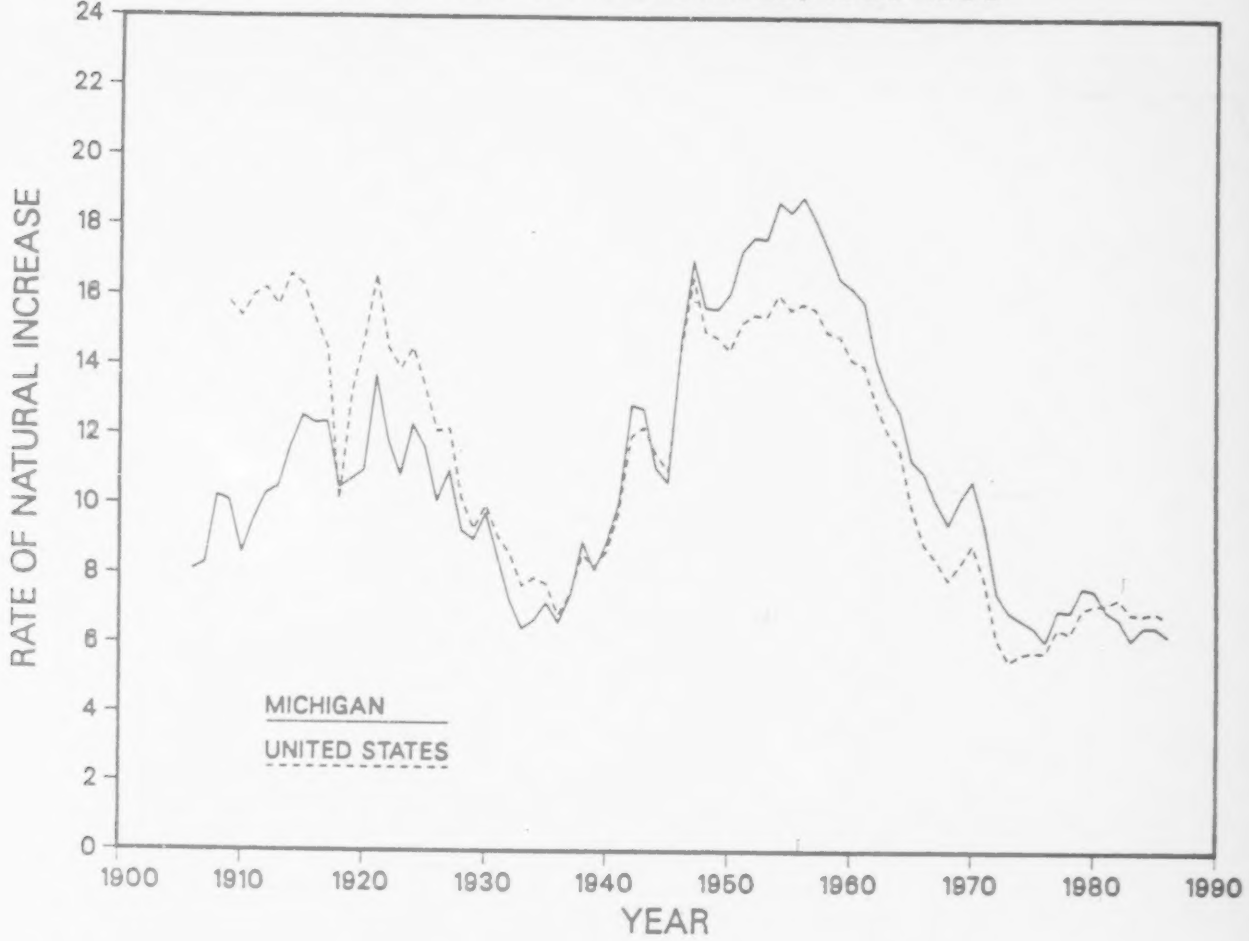
[1] Based on records with known duration only.

and 3 months. For over fifty percent of the marriages ended by divorce or annulment in 1986, the length of time between the date of separation and the date of dissolution was 12 months .

REFERENCE APPENDIX

SECTION IV

FIGURE 4.1
RATE OF NATURAL INCREASE,[1] MICHIGAN, 1906-1986, AND THE UNITED STATES,[2] 1909-1986



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[1] Excess of live births over deaths per 1,000 population.

[2] Rates for the United States for 1909-1932 are based on death rates from the death-registration states and estimated birth rates for the United States, adjusted for under-registration. For 1933-1959 rates are based on registered deaths in the United States and births adjusted for under-registration. After 1959 rates are based on registered births and deaths.

TABLE 4.1
POPULATION, LIVE BIRTHS, DEATHS (ALL AGES, INFANT, NEONATAL, POSTNEONATAL, PERINATAL, FETAL, AND MATERNAL), MARRIAGES AND DIVORCES, MICHIGAN, 1900-1986

(Deaths exclusive of fetal deaths. Perinatal deaths include deaths under 1 week and fetal deaths. Divorces include annulments.)

Year	Population[1]	Live Births	DEATHS							Marriages	Divorces
			All Ages	Under 1 Year	Under 28 Days[1]	28-364 Days	Peri-natal	Fetal	Maternal		
1900	2,420,982	43,699	32,453	6,866				1,325	452	23,295	2,435
1901	2,459,901	43,221	32,834	6,313				1,501	531	24,079	2,448
1902	2,498,820	45,546	31,472	5,949				1,793	468	25,653	2,828
1903	2,537,739	46,020	33,176	6,488				1,814	427	26,029	2,945
1904	2,576,658	47,508	34,494	6,419				1,911	436	24,918	2,808
1905	2,615,578	46,976	34,679	7,054				2,044	416	26,307	2,825
1906	2,654,497	58,599	37,033	7,952				2,358	400	27,519	3,192
1907	2,693,416	59,029	36,701	6,906				2,358	391	27,940	3,107
1908	2,732,335	64,772	36,761	7,697				2,694	440	25,765	3,020
1909	2,771,254	64,323	36,313	7,443				2,540	405	27,353	3,516
1910	2,810,173	64,109	39,913	7,998				2,559	431	29,039	3,716
1911	2,895,997	65,756	38,007	7,131				2,716	451	29,859	4,125
1912	2,981,821	69,537	38,804	6,985				2,906	396	31,694	3,838
1913	3,067,645	73,058	40,827	7,659				2,953	528	33,529	3,978
1914	3,153,469	76,761	39,906	7,431				3,113	507	35,316	4,395
1915	3,239,293	81,100	40,441	6,943				3,357	488	35,527	4,757
1916	3,325,116	87,062	46,047	8,415				3,689	503	40,143	5,540
1917	3,410,940	89,419	47,236	7,916				3,550	586	42,731	5,627
1918	3,496,764	91,261	54,617	8,197				3,686	709	33,260	5,493
1919	3,582,588	84,062	45,636	7,560				3,361	578	45,579	7,469
1920	3,668,412	92,245	51,982	8,587				3,770	795	50,805	8,679
1921	3,785,799	96,035	44,186	7,584				3,669	605	41,508	7,676
1922	3,903,186	90,042	43,817	6,730				3,779	551	43,561	7,591
1923	4,020,573	92,956	49,333	7,477				3,657	583	49,569	8,745
1924	4,137,960	98,187	47,304	7,088	4,119	2,969	6,791	3,703	636	49,786	9,400
1925	4,255,347	98,983	49,417	7,498	4,022	3,476	6,667	3,670	629	46,276	9,650
1926	4,372,734	98,289	54,080	7,620	4,054	3,566	6,773	3,816	631	39,788	9,795
1927	4,490,121	99,940	50,600	6,766	3,915	2,851	6,794	3,834	667	36,276	10,617
1928	4,607,508	97,462	54,755	6,806	3,739	3,067	6,594	3,701	603	37,300	10,615
1929	4,724,895	98,695	56,117	6,605	3,777	2,828	6,613	3,710	617	36,816	12,094
1930	4,842,325	98,882	51,561	6,213	3,624	2,589	6,518	3,714	597	29,482	10,639
1931	4,883,703	90,547	49,068	5,187	3,084	2,103	5,643	3,220	539	28,856	9,507
1932	4,925,081	85,254	49,569	4,630	2,798	1,832	5,210	2,980	493	28,552	7,889
1933	4,966,459	80,482	48,507	4,094	2,591	1,503	4,906	2,776	447	33,132	7,671
1934	5,007,837	83,944	50,440	4,377	2,717	1,660	4,781	2,607	450	43,241	10,124
1935	5,049,216	87,403	51,051	4,170	2,550	1,620	4,832	2,717	438	45,313	10,844
1936	5,090,594	88,457	54,777	4,479	2,647	1,832	4,726	2,625	425	47,023	11,419
1937	5,131,972	91,566	53,468	4,374	2,700	1,674	4,919	2,707	326	47,954	12,472
1938	5,173,350	96,962	50,678	4,319	2,734	1,585	4,984	2,732	345	30,105	10,646
1939	5,214,728	94,432	52,017	3,952	2,594	1,358	4,706	2,572	280	37,725	11,589
1940	5,256,106	99,106	52,092	4,022	2,629	1,393	4,749	2,602	292	46,342	12,054
1941	5,437,546	107,498	52,671	4,166	2,687	1,479	4,991	2,769	298	50,989	13,317
1942	5,538,856	124,068	52,738	4,606	3,091	1,515	5,581	3,067	260	51,582	14,085
1943	5,377,329	125,441	56,774	4,804	2,979	1,825	5,563	3,213	237	44,385	15,259

TABLE 4.1 (continued)

Year	Population[1]	Live Births	DEATHS							Marriages	Divorces
			All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Peri-natal	Fetal	Maternal		
1944	5,377,329	113,586	54,016	4,326	2,784	1,542	5,140	2,874	198	41,678	18,356
1945	5,435,092	111,557	53,641	4,008	2,670	1,338	4,906	2,703	166	48,329	21,133
1946	5,708,415	138,572	54,856	4,541	3,323	1,218	5,978	3,168	163	78,808	29,158
1947	6,069,000	160,275	56,807	5,055	3,677	1,378	6,583	3,422	173	71,319	21,386
1948	6,195,000	153,726	56,520	4,617	3,352	1,265	5,968	3,132	120	61,986	16,017
1949	6,352,000	156,469	57,107	4,520	3,232	1,288	5,746	2,994	105	53,109	16,274
1950	6,371,766	160,055	57,567	4,214	3,043	1,171	5,781	3,095	91	58,180	15,979
1951	6,545,000	172,451	59,181	4,505	3,296	1,209	6,088	3,158	94	53,411	15,446
1952	6,708,000	177,835	59,138	4,689	3,414	1,275	6,266	3,224	82	50,487	14,925
1953	6,852,000	182,968	62,087	4,728	3,369	1,339	6,188	3,180	79	53,308	16,537
1954	7,024,000	192,104	60,706	4,795	3,560	1,235	6,415	3,249	91	51,243	16,281
1955	7,236,000	196,294	63,087	4,873	3,707	1,166	6,381	3,029	61	55,698	17,676
1956	7,516,000	206,068	64,352	5,047	3,796	1,251	6,655	3,245	84	57,068	16,228
1957	7,803,000	208,488	66,435	5,093	3,884	1,209	6,668	3,154	79	55,121	15,442
1958	7,866,000	202,690	65,899	4,980	3,789	1,191	6,516	3,101	69	55,159	14,040
1959	7,960,000	198,301	66,812	4,846	3,674	1,172	6,250	2,928	72	58,826	16,16[illegible]
1960	7,823,194	195,056	67,912	4,702	3,580	1,122	6,247	3,008	75	61,090	16,656
1961	7,903,000	192,825	67,375	4,604	3,475	1,129	5,875	2,735	78	63,320	16,219
1962	7,939,000	182,790	70,049	4,367	3,251	1,116	5,669	2,703	56	65,002	17,500
1963	8,030,000	178,871	72,438	4,150	3,109	1,041	5,407	2,540	71	68,160	17,479
1964	8,100,000	175,103	72,129	4,043	3,071	972	5,293	2,466	62	73,911	19,400
1965	8,199,283	166,464	73,665	3,936	2,909	1,027	5,139	2,475	54	81,247	20,305
1966	8,314,070	165,794	74,596	3,751	2,830	921	4,909	2,295	54	83,903	21,727
1967	8,615,000	162,756	75,360	3,595	2,714	881	4,693	2,195	52	84,363	23,620
1968	8,675,000	153,058	76,855	3,438	2,617	821	4,476	2,064	44	90,984	25,400
1969	8,734,000	165,760	76,693	3,356	2,550	806	4,488	2,175	27	93,392	28,347
1970	8,875,083	171,667	76,321	3,492	2,671	821	4,522	2,060	29	91,933	29,934
1971	8,972,000	162,244	77,395	3,157	2,412	745	4,139	1,923	32	92,134	31,790
1972	9,025,000	146,854	79,210	2,801	2,115	686	3,700	1,765	35	94,447	35,505
1973	9,072,000	141,550	78,522	2,561	1,902	659	3,392	1,682	26	94,486	37,128
1974	9,109,000	137,414	76,143	2,387	1,734	653	2,947	1,438	19	88,023	39,940[3]
1975	9,108,000	133,931	74,522	2,205	1,563	642	2,673	1,356	16	82,856	40,782
1976	9,117,000	131,378	75,801	1,978	1,424	554	2,495	1,264	14	82,753	43,101
1977	9,157,000	138,416	74,144	1,945	1,367	578	2,452	1,284	11	86,088	43,036
1978	9,202,000	138,802	74,773	1,931	1,281	650	2,302	1,201	15	88,333	45,029
1979	9,249,000	144,452	73,480	1,921	1,295	626	2,285	1,175	11	89,450	44,242
1980	9,262,078	145,162	74,991	1,851	1,284	567	2,235	1,135	16	86,898	45,047
1981	9,270,000	140,579	75,818	1,851	1,281	570	2,151	1,040	7	85,252	43,167
1982	9,227,327	137,950	75,536	1,672	1,202	470	1,989	954	11	82,633	39,739
1983	9,155,480	133,026	76,639	1,573	1,067	506	1,843	933	6	78,910	37,991
1984	9,074,622	135,782	76,401	1,595	1,100	495	1,884	929	4	80,810	37,563
1985	9,088,341	138,052	78,635	1,575	1,071	504	1,867	953	9	79,022	38,775
1986	9,144,545	137,626	80,177	1,565	1,079	486	1,782	865	11	77,815	39,553

[1] -1971-1979 population estimates have been revised by the U.S. Census Bureau.

[2] -For years prior to 1950 deaths under 1 month of age are included in deaths under 28 days.

[3] -Estimate

TABLE 4.2

LIVE BIRTH RATES, DEATH RATES (ALL AGES, INFANT, NEONATAL, POSTNEONATAL, PERINATAL, AND MATERNAL), FETAL DEATH RATIOS, MARRIAGE AND DIVORCE RATES, MICHIGAN, 1900-1986[1]

(Birth rate, death rate for all ages, rate of persons married and rate of persons divorced per 1,000 population. Fetal death ratio, mortality rates for deaths under 1 year, under 28 days, and from 28-364 days per 1,000 live births. Maternal mortality rate per 10,000 live births. Perinatal mortality rate per 1,000 live births and fetal deaths.)

Year	Live Births	DEATHS							PERSONS	
		All Ages	Under 1 Year	Under 28 Days[1]	28-364 Days	Peri-natal	Fetal	Maternal	Married	Divorced
1900	18.1	13.4	157.1				30.2	103.4	19.2	2.0
1901	17.6	13.3	146.2				34.7	122.9	19.6	2.0
1902	18.2	12.6	130.6				39.4	102.8	20.5	2.3
1903	18.1	13.1	141.0				39.4	92.8	20.5	2.3
1904	18.4	13.4	135.1				40.2	91.8	19.3	2.2
1905	18.0	13.3	150.2				43.5	88.6	20.1	2.2
1906	22.1	14.0	135.7				40.2	68.3	20.7	2.4
1907	21.9	13.6	117.0				39.9	66.2	20.7	2.3
1908	23.7	13.5	118.8				41.6	67.9	18.9	2.2
1909	23.2	13.1	115.7				39.5	63.0	19.7	2.5
1910	22.8	14.2	124.8				39.9	67.2	20.7	2.6
1911	22.7	13.1	108.4				41.3	68.6	20.6	2.8
1912	23.3	13.0	100.4				41.8	56.9	21.3	2.6
1913	23.8	13.3	104.8				40.4	72.3	21.9	2.6
1914	24.3	12.7	96.8				40.6	66.0	22.4	2.8
1915	25.0	12.5	85.6				41.4	60.2	21.9	2.9
1916	26.2	13.8	96.7				42.4	57.8	24.1	3.3
1917	26.2	13.8	88.5				39.7	65.5	25.1	3.3
1918	25.1	15.6	89.8				40.4	77.7	19.0	3.1
1919	23.5	12.7	89.9				40.0	68.8	25.4	4.2
1920	25.1	14.2	93.1				40.9	86.2	27.7	4.7
1921	25.4	11.7	79.0				38.2	63.0	21.9	4.1
1922	23.1	11.2	74.7				42.0	61.2	22.3	3.9
1923	23.1	12.3	80.4				39.3	62.7	24.7	4.4
1924	23.7	11.4	72.2	41.9	30.2	66.7	37.7	64.8	24.1	4.5
1925	23.3	11.6	75.7	40.6	35.1	64.9	37.1	63.5	21.7	4.5
1926	22.5	12.4	77.5	41.2	36.3	66.3	38.8	64.2	18.7	4.5
1927	22.3	11.3	67.7	39.2	28.5	65.5	38.4	66.7	16.2	4.7
1928	21.2	11.9	69.8	38.4	31.5	65.2	38.0	61.9	16.2	4.6
1929	20.9	11.9	66.9	38.3	28.7	64.6	37.6	62.5	15.6	5.1
1930	20.4	10.6	62.8	36.6	26.2	63.5	37.6	60.4	12.2	4.4
1931	18.5	10.1	57.3	34.1	23.2	60.2	35.6	59.5	11.8	3.9
1932	17.3	10.1	54.3	32.8	21.5	59.0	35.0	57.8	11.6	3.2
1933	16.2	9.8	50.9	32.2	18.7	58.9	34.5	55.5	13.3	3.1
1934	16.8	10.1	52.1	32.4	19.8	55.2	31.1	53.6	17.3	4.0
1935	17.3	10.1	47.7	29.2	18.5	53.6	31.1	50.1	17.9	4.3
1936	17.4	10.8	50.6	29.9	20.7	51.9	29.7	48.0	18.5	4.5
1937	17.8	10.4	47.8	29.5	18.3	52.2	29.6	35.6	18.7	4.9
1938	18.7	9.8	44.5	28.2	16.3	50.0	28.2	35.6	11.6	4.1
1939	18.1	10.0	41.8	27.5	14.4	48.5	27.2	29.6	14.5	4.4
1940	18.9	9.9	40.6	26.5	14.1	46.7	26.3	29.5	17.6	4.5
1941	19.8	9.7	38.8	25.0	13.8	45.3	25.8	27.7	18.8	4.9

TABLE 4.2 (continued)

Year	Live Births	DEATHS							PERSONS	
		All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Peri-natal	Fetal	Maternal	Married	Divorced
1942	22.4	9.5	37.1	24.9	12.2	43.9	24.7	21.0	18.6	5.1
1943	23.3	10.6	38.3	23.7	14.5	43.2	25.6	18.9	16.5	5.7
1944	21.1	10.0	38.1	24.5	13.6	44.1	25.3	17.4	15.5	6.8
1945	20.5	9.9	35.9	23.9	12.0	42.9	24.2	14.9	17.8	7.8
1946	24.3	9.6	32.8	24.0	8.8	42.2	22.9	11.8	27.6	10.2
1947	26.4	9.4	31.5	22.9	8.6	40.2	21.4	10.8	23.5	7.1
1948	24.8	9.1	30.0	21.8	8.2	38.0	20.4	7.8	20.0	5.2
1949	24.6	9.0	28.9	20.7	8.2	36.0	19.1	6.7	16.7	5.1
1950	25.1	9.0	26.3	19.0	7.3	35.4	19.3	5.7	18.3	5.0
1951	26.3	9.0	26.1	19.1	7.0	34.7	18.3	5.5	16.3	4.7
1952	26.5	8.8	26.4	19.2	7.2	34.6	18.1	4.6	15.1	4.4
1953	26.7	9.1	25.8	18.5	7.3	33.2	17.4	4.3	15.6	4.8
1954	27.3	8.6	25.0	18.5	6.4	32.8	16.9	4.9	14.6	4.6
1955	27.1	8.7	24.8	18.9	5.9	32.0	15.4	3.1	15.4	4.9
1956	27.4	8.6	24.5	18.4	6.1	31.8	15.7	4.1	15.2	4.3
1957	26.7	8.5	24.4	18.6	5.8	31.5	15.1	3.8	14.1	4.0
1958	25.8	8.4	24.6	18.7	5.9	31.7	15.3	3.4	14.0	3.6
1959	24.9	8.4	24.4	18.5	5.9	31.1	14.8	3.6	14.8	4.1
1960	24.9	8.7	24.1	18.4	5.8	31.5	15.4	3.8	15.6	4.3
1961	24.4	8.5	23.9	18.0	5.9	30.0	14.2	4.0	16.0	4.1
1962	23.0	8.5	23.9	17.8	6.1	30.6	14.8	3.1	16.4	4.4
1963	22.3	9.0	23.2	17.4	5.8	29.8	14.2	4.0	17.0	4.4
1964	21.6	8.9	23.1	17.5	5.6	29.8	14.1	3.5	18.2	4.8
1965	20.3	9.0	23.6	17.5	6.2	30.4	14.9	3.2	19.8	5.0
1966	19.9	9.0	23.6	17.1	5.6	29.2	13.8	3.3	20.2	5.2
1967	18.9	8.7	22.1	16.7	5.4	28.4	13.5	3.2	19.6	5.5
1968	18.3	8.9	21.6	16.5	5.2	27.8	13.0	2.8	21.0	5.9
1969	19.0	8.8	20.2	15.4	4.9	26.7	13.1	1.6	21.4	6.5
1970	19.3	8.6	20.3	15.6	4.8	26.0	12.0	1.7	20.7	6.7
1971	18.1	8.6	19.5	14.9	4.6	25.2	11.9	2.0	20.5	7.1
1972	16.3	8.8	19.1	14.4	4.7	24.9	12.0	2.4	20.9	7.9
1973	15.6	8.7	18.1	13.4	4.7	23.7	11.9	1.8	20.8	8.2
1974	15.1	8.4	17.4	12.6	4.8	21.2	10.5	1.4	19.3	8.8[3]
1975	14.7	8.2	16.5	11.7	4.8	19.8	10.1	1.2	18.2	9.0
1976	14.4	8.3	15.1	10.8	4.2	18.8	9.6	1.1	18.2	9.5
1977	15.1	8.1	14.1	9.9	4.2	17.6	9.3	0.8	18.8	9.4
1978	15.1	8.1	13.9	9.2	4.7	16.4	8.7	1.1	19.2	9.8
1979	15.6	7.9	13.3	9.0	4.3	15.7	8.1	0.8	19.3	9.6
1980	15.7	8.1	12.8	8.8	3.9	15.3	7.8	1.1	18.8	9.7
1981	15.2	8.2	13.2	9.1	4.1	15.2	7.4	0.5	18.4	9.3
1982	15.0	8.2	12.1	8.7	3.4	14.3	6.9	0.8	17.9	8.6
1983	14.5	8.4	11.8	8.0	3.8	13.6	7.0	0.5	17.2	8.3[3]
1984	15.0	8.4	11.7	8.1	3.6	13.8	6.8	0.3	17.8	8.3
1985	15.2	8.7	11.4	7.8	3.7	13.4	6.9	0.7	17.4	8.5
1986	15.1	8.8	11.4	7.8	3.5	12.9	6.3	0.8	17.0	8.7

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[1] 1971-1979 birth, death, marriage and divorce rates have been recalculated using revised population estimates

[2] For years prior to 1950 deaths under 1 month of age are included in deaths under 28 days

[3] Estimate.

TABLE 4.3
NUMBER OF LIVE BIRTHS BY AGE OF MOTHER, MICHIGAN RESIDENTS, 1920-1986

YEAR	AGE OF MOTHER									
	ALL AGES[1]	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+	AGE NOT STATED
1920	92,740	34	8,129	26,344	26,251	17,521	10,427	3,523	336	175
1921	96,322	39	8,747	26,583	27,292	18,433	11,150	3,572	337	169
1922	90,209	28	8,125	24,575	25,154	17,690	10,584	3,485	343	225
1923	93,066	37	8,725	25,887	25,459	18,072	10,770	3,476	382	258
1924	98,025	38	9,877	28,000	25,781	18,707	11,395	3,682	321	224
1925	99,220	62	10,248	28,116	26,204	18,869	11,406	3,695	379	241
1926	98,781	76	10,496	28,479	25,876	18,444	11,219	3,568	354	269
1927	100,178	59	10,685	29,302	25,707	18,790	11,287	3,722	332	294
1928	97,797	54	10,788	28,895	25,003	17,953	10,913	3,558	315	318
1929	99,134	56	11,312	30,582	25,557	16,957	10,555	3,523	293	299
1930	99,325	60	11,476	29,956	25,861	17,125	10,684	3,582	291	290
1931	90,929	61	10,109	27,255	23,806	15,937	9,905	3,317	302	237
1932	85,736	62	9,297	25,686	22,608	14,988	9,314	3,250	291	240
1933	80,923	52	8,642	23,874	21,618	14,298	8,795	3,173	261	210
1934	83,925	48	9,039	25,458	22,507	14,968	8,391	3,050	259	205
1935	87,446	47	9,808	27,631	22,938	15,026	8,473	3,029	284	210
1936	88,427	53	9,764	28,681	23,584	14,814	8,194	2,866	274	197
1937	91,539	54	10,524	30,532	24,366	15,022	7,949	2,653	242	197
1938	96,963	64	11,024	32,581	26,116	15,690	8,397	2,698	253	140
1939	94,302	51	10,366	31,036	26,085	15,976	8,021	2,416	209	130
1940	99,021	51	10,671	32,960	27,860	16,549	8,146	2,390	202	192
1941	107,458	50	11,309	36,833	31,067	17,132	8,351	2,361	200	155
1942	123,886	66	12,721	43,947	36,034	19,367	8,985	2,445	202	119
1943	125,778	67	11,934	41,627	37,773	21,449	9,980	2,615	184	149
1944	114,700	76	10,113	36,096	33,654	21,094	10,636	2,714	182	135
1945	112,655	73	9,294	32,790	33,143	22,831	11,185	2,970	229	140
1946	139,277	72	10,899	45,999	41,985	25,184	11,811	3,002	223	102
1947	161,085	91	15,594	55,954	47,793	26,296	12,009	3,073	182	93
1948	154,730	95	16,245	53,520	45,059	25,268	11,391	2,888	173	91
1949	157,178	117	16,404	53,608	46,363	25,971	11,565	2,906	181	63
1950	160,945	111	16,310	53,442	48,186	27,422	12,382	2,831	169	92
1951	173,506	104	17,974	57,340	52,044	29,674	13,086	3,040	160	84
1952	178,634	134	17,206	58,012	54,198	31,756	13,880	3,176	220	52
1953	182,810	166	18,510	58,070	54,734	32,948	14,798	3,350	190	44
1954	192,332	208	20,522	60,776	55,962	35,152	15,862	3,598	220	32
1955	196,423	195	21,417	61,852	56,462	35,868	16,554	3,862	198	15
1956	206,226	192	22,808	66,332	58,392	36,870	17,282	4,172	164	14
1957	208,808	190	23,798	67,086	58,424	36,980	17,956	4,160	200	14
1958	202,900	222	23,034	65,834	55,130	36,278	17,892	4,296	196	18
1959	198,576	200	21,922	65,426	53,434	34,934	18,030	4,424	198	8

TABLE 4.3
NUMBER OF LIVE BIRTHS BY AGE OF MOTHER, MICHIGAN RESIDENTS, 1920-1986 (Continued)

YEAR	AGE OF MOTHER									
	ALL AGES[1]	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+	AGE NOT STATED
1960	195,056	186	22,786	65,108	51,842	33,228	17,410	4,288	202	6
1961	192,825	212	23,891	64,336	50,277	32,456	17,067	4,363	203	20
1962	182,790	268	22,702	62,243	47,109	29,817	16,160	4,250	224	17
1963	178,871	210	21,686	62,834	46,063	28,364	15,117	4,359	229	9
1964	175,103	264	22,526	62,196	44,671	26,542	14,509	4,162	220	13
1965	166,464	267	24,653	59,439	40,693	23,767	13,528	3,886	211	20
1966	165,794	310	28,690	60,711	39,225	21,205	11,846	3,547	223	37
1967	162,756	316	27,267	61,541	40,052	19,840	10,479	3,059	178	24
1968	159,058	400	26,390	60,072	41,561	16,613	9,095	2,739	163	25
1969	165,760	421	28,061	63,376	44,615	18,535	8,157	2,433	134	28
1970	171,667	489	29,764	65,892	46,262	19,003	7,904	2,223	118	12
1971	162,244	472	28,480	62,367	43,639	18,259	6,975	1,926	112	14
1972	146,854	503	28,108	54,199	40,442	16,133	5,805	1,555	95	14
1973	141,550	569	27,808	51,284	39,845	15,520	5,163	1,277	62	22
1974	137,414	501	25,977	49,975	40,215	15,317	4,291	1,063	50	25
1975	133,931	463	24,509	48,675	40,061	14,891	4,273	982	54	23
1976	131,378	404	22,593	47,161	41,412	14,893	4,053	799	47	16
1977	138,416	426	22,585	49,740	43,346	17,293	4,178	771	51	26
1978	138,802	345	21,487	49,498	43,744	18,367	4,562	729	50	20
1979	144,452	355	21,239	51,319	46,084	19,962	4,720	715	41	17
1980	145,162	331	20,000	51,218	47,113	21,024	4,692	740	22	22
1981	140,579	300	18,397	47,737	46,527	22,178	4,701	695	34	10
1982	137,950	319	17,344	45,586	45,995	22,564	5,395	711	29	7
1983	133,026	328	16,589	42,034	45,065	22,505	5,669	791	38	7
1984	135,782	341	16,442	41,664	45,908	24,320	6,295	780	30	2
1985	138,052	352	16,279	41,125	47,049	25,491	6,864	851	36	5
1986	137,626	335	16,536	39,611	46,421	26,331	7,503	842	35	12

[1] Total live births for the years 1920 through 1959 differ from figures in Table 4.1 as they are derived from outside sources. Live births by age of mother were not tabulated in Michigan prior to 1960. These data were obtained from the following sources:

1920-1923: Unpublished tables from the National Center for Health Statistics.
1924-1932: Bureau of the Census publication, *Birth, Stillbirth and Infant Mortality Statistics for Birth Registration Areas of the United States*.
1933-1936: Unpublished tables from the National Center for Health Statistics.
1937-1949: Bureau of the Census publication, *Vital Statistics of the United States* series.
1950-1959: Department of Health Education and Welfare publication, *Vital Statistics of the United States* series.

TABLE 4.4
LIVE BIRTH RATES BY AGE OF MOTHER, MICHIGAN RESIDENTS, 1920-1986

(Live birth rates are per 1,000 women per year. Total fertility rate is total children to 1,000 women in their lifetime assuming constant live birth rates.)

Year	AGE OF MOTHER								Total Fertility Rate
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+[1]	
1920	0.2	55.7	173.1	164.0	124.2	83.8	34.3	3.8	3,195.5
1921	0.2	56.9	167.3	165.5	125.8	84.8	32.8	3.6	3,184.5
1922	0.2	50.8	149.6	149.1	117.3	77.1	30.7	3.5	2,891.5
1923	0.2	52.6	152.6	147.5	116.5	75.4	29.3	3.8	2,889.5
1924	0.2	57.4	160.0	146.1	117.3	76.7	29.9	3.1	2,953.5
1925	0.3	57.4	155.9	145.4	115.2	73.9	28.8	3.5	2,902.0
1926	0.4	56.9	153.3	140.5	109.7	70.1	26.8	3.2	2,804.5
1927	0.3	56.0	153.3	136.8	108.9	68.1	27.0	2.9	2,766.5
1928	0.2	54.8	147.1	130.3	101.5	63.7	25.0	2.6	2,626.0
1929	0.2	55.7	151.5	130.6	93.6	59.6	23.9	2.4	2,587.5
1930	0.3	55.2	145.5	130.2	92.8	58.9	23.7	2.3	2,544.5
1931	0.3	47.8	130.4	118.3	85.3	54.3	21.5	2.3	2,301.0
1932	0.3	43.4	121.5	111.2	79.4	50.8	20.8	2.2	2,148.0
1933	0.2	39.7	111.6	105.2	75.0	47.7	20.0	1.9	2,006.5
1934	0.2	41.0	117.6	108.4	77.8	45.3	18.9	1.8	2,055.0
1935	0.2	43.9	126.2	109.4	77.4	45.5	18.5	2.0	2,115.5
1936	0.2	43.1	129.5	111.4	75.5	43.8	17.3	1.8	2,113.0
1937	0.2	45.9	136.4	113.9	75.9	42.3	15.8	1.6	2,160.0
1938	0.3	47.4	143.9	120.9	78.5	44.4	15.8	1.6	2,264.0
1939	0.2	44.1	135.6	119.6	79.2	42.3	14.0	1.3	2,181.5
1940	0.2	44.9	142.8	126.8	81.5	42.8	13.7	1.2	2,269.5
1941	0.2	48.1	157.8	137.1	81.6	42.5	13.2	1.2	2,408.5
1942	0.3	54.5	186.6	155.3	89.9	44.7	13.4	1.2	2,729.5
1943	0.3	51.6	175.1	159.0	97.1	48.6	14.1	1.1	2,734.5
1944	0.3	44.1	150.5	138.5	93.2	50.6	14.3	1.0	2,462.5
1945	0.3	40.8	135.5	133.4	98.5	52.1	15.4	1.3	2,386.5
1946	0.3	48.3	188.5	165.3	106.2	53.8	15.3	1.2	2,894.5
1947	0.4	69.7	227.3	184.2	108.4	53.6	15.4	1.0	3,300.0
1948	0.4	73.2	215.5	170.0	101.9	49.8	14.2	1.0	3,130.0
1949	0.5	74.6	214.0	171.4	102.5	49.6	14.1	1.0	3,138.5
1950	0.5	74.6	212.0	175.5	106.5	52.3	13.6	0.9	3,179.5
1951	0.4	79.1	229.0	192.2	114.4	53.9	14.1	0.8	3,419.5
1952	0.5	73.5	233.0	202.5	121.7	56.1	14.4	1.1	3,514.0
1953	0.6	76.8	234.5	207.0	125.5	58.7	14.9	0.9	3,594.5
1954	0.7	82.8	246.8	214.1	133.1	61.8	15.6	1.1	3,780.0
1955	0.6	84.1	253.0	218.6	135.4	63.4	16.4	0.9	3,862.0
1956	0.6	87.2	272.4	228.9	138.0	65.0	17.4	0.8	4,051.5
1957	0.6	88.6	277.1	231.8	137.6	66.4	17.0	0.9	4,100.0
1958	0.6	83.6	273.4	221.5	134.3	65.0	17.2	0.9	3,982.5
1959	0.6	77.6	273.3	217.4	128.6	64.4	17.3	0.9	3,900.5

TABLE 4.4
LIVE BIRTH RATES BY AGE OF MOTHER, MICHIGAN RESIDENTS, 1920-1986 (continued)

Year	AGE OF MOTHER								Total Fertility Rate
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+[1]	
1960	0.5	79.3	273.1	213.0	121.8	61.4	16.6	0.9	3,833.0
1961	0.6	78.1	252.0	200.7	120.2	61.3	16.8	0.9	3,653.0
1962	0.7	70.7	231.5	183.9	111.4	58.9	16.3	0.9	3,371.5
1963	0.5	64.6	222.5	175.9	107.0	55.9	16.6	0.9	3,219.5
1964	0.6	64.2	210.1	167.0	101.0	54.4	15.8	0.9	3,070.0
1965	0.6	67.4	192.0	149.0	91.2	51.5	14.7	C.8	2,836.0
1966	0.7	75.4	187.9	140.7	82.1	45.8	13.4	0.9	2,734.5
1967	0.7	69.0	182.8	140.8	77.6	41.2	11.5	0.7	2,621.5
1968	0.9	64.3	171.5	143.2	73.4	36.3	10.2	0.6	2,502.0
1969	0.9	66.0	174.2	150.8	73.8	33.1	9.1	0.5	2,542.0
1970	1.0	68.2	176.2	154.2	76.2	32.4	8.3	0.4	2,584.5
1971	1.0	64.7	161.7	138.6	69.1	27.9	7.2	0.4	2,353.0
1972	1.1	63.7	137.6	124.1	58.6	22.8	5.9	0.4	2,071.0
1973	1.2	62.8	127.5	118.3	54.2	19.9	4.9	0.2	1,945.0
1974	1.1	58.5	121.9	115.7	51.5	16.3	4.1	0.2	1,846.5
1975	1.1	55.3	117.0	112.3	48.4	16.0	3.9	0.2	1,771.0
1976	0.9	51.1	111.6	113.0	46.9	15.0	3.2	0.2	1,709.5
1977	1.0	50.9	115.5	114.9	52.6	15.2	3.1	0.2	1,767.0
1978	0.8	48.3	112.7	112.6	54.0	16.3	3.0	0.2	1,739.5
1979	0.9	47.6	114.6	115.2	56.7	16.6	3.0	0.2	1,774.0
1980	0.8	44.8	113.1	115.6	58.4	16.4	3.1	0.1	1,761.5
1981	0.9	51.4	122.9	112.6	58.9	14.0	2.6	0.2	1,817.5
1982	1.0	51.0	121.4	111.1	59.5	15.6	2.6	0.1	1,811.5
1983	1.0	51.4	115.9	108.5	58.8	15.9	2.8	0.2	1,772.5
1984	1.0	43.8	103.8	111.4	65.2	19.3	3.0	0.1	1,738.0
1985	1.0	43.9	104.1	115.1	67.1	20.5	3.1	0.2	1,775.0
1986	1.0	45.2	101.6	114.4	68.3	21.8	2.9	0.1	1,776.5

[1]-Number of live births to women aged 45 and over per 1,000 women 45-49 years of age

SOURCE: Population figures used for 1920-1970 rates are from General Population Characteristics, Michigan, USBC, 1971, with arithmetic extrapolation between census years. For 1971-1985 population source, see Technical Notes.

TABLE 4.5
REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1986

YEAR	DIPH-THERIA	SMALL-POX	TYPHOID FEVER	WHOOP-ING COUGH	MEASLES	HEPATI-TIS, ALL TYPES	TB' (ALL FORMS)	MENIN-' GOCOC CAL INFEC TIONS	POLIO	SYPHI-LIS	GONOR-RHEA	ACQUIRED IMMUNE DEFICIENCY SYNDROME
1900	2,706	694	5,122	3,375	20,356		2,721	654				
1901	2,498	5,088	3,002	2,955	4,629		2,915	506				
1902	2,993	7,086	2,456	3,534	11,978		2,658	528				
1903	3,670	6,341	2,840	4,172	8,941		2,745	525				
1904	3,510	5,753	3,028	1,779	10,386		2,928	448				
1905	2,159	2,985	2,774	1,196	6,061		2,590	577				
1906	3,648	1,240	3,163	1,364	7,403		2,653	533				
1907	2,935	1,712	1,953	872	12,139		2,699	575				
1908	26,58	2,306	2,656	1,248	4,775		2,705	487				
1909	3,109	1,533	2,694	1,054	9,047		3,423	457				
1910	3,433	3,319	3,361	1,136	13,934		4,415	522	104			
1911	3,762	898	2,660	1,897	9,639		5,254	478	68			
1912	3,294	1,127	2,847	1,255	2,834		1,958	88	78			
1913	5,505	1,995	2,253	929	9,185		1,920	165	56			
1914	5,149	1,527	2,167	1,822	11,356		2,566	205	49			
1915	4,386	1,094	1,956	2,258	4,438		3,648	107	95			
1916	5,625	1,581	2,513	1,837	12 143		7,076	163	598			
1917	8,499	3,674	1,723	3,211	14,472		4,856	75	91			
1918	6,128	5,241	1,339	2,563	6,726		3,655	95	121			
1919	7,896	2,381	1,254	1,829	8,885		4,231	75	155	5,077	7,910	
1920	10,360	4,818	1,421	7,171	22,364		4,994	203	67	8,117	11,463	
1921	12,075	4,512	1,837	6,696	3,043		5,708	173	483	7,421	9,774	
1922	8,513	1,230	1,108	5,642	12,107		5,573	159	43	7,900	9,717	
1923	7,725	2,311	982	7,617	30,041		5,471	186	39	10,480	9,597	
1924	6,011	4,527	782	4,364	18,290		5,570	157	647	13,000	10,490	
1925	3,925	784	962	7,576	10,332		5,785	128	99	14,668	10,660	
1926	5,377	549	583	8,776	39,946		5,387	96	107	14,872	10,707	
1927	4,575	1,467	581	6,818	8,303		5,406	138	282	15,713	9,318	
1928	3,724	1,335	390	9,700	27,039		5,885	276	77	15,323	8,592	
1929	4,618	2,410	310	9,340	18,040		6,248	1,864	180	16,606	9,661	
1930	3,206	2,375	504	7,937	28,129		5,128	901	208	16,538	8,554	
1931	1,831	915	424	11,448	6,212		6,132	293	1,137	14,662	7,843	
1932	1,188	222	513	13,091	42 129		7,103	129	112	11,969	6,963	
1933	1,152	46	453	11,720	21,654		6,624	86	93	7,691	6,447	
1934	614	49	486	11,255	6,528		5,264	53	230	6,483	6,188	
1935	645	16	355	13,427	79,061		4,642	113	614	6,416	6,372	
1936	661	32	287	14,287	2,453		5,157	120	152	6,401	6,460	
1937	842	152	241	11,426	6,154		6,469	87	421	8,708	7,072	
1938	619	274	285	14,563	79,400		6,335	69	59	14,684	7,046	
1939	452	371	177	8,997	12,948		6,119	46	904	13,144	6,364	
1940	264	76	120	11,757	20,206		6,063	49	1,228	9,999	7,650	
1941	242	114	147	16,512	70,748		5,371	49	270	11,370	8,767	
1942	243	17	74	11,602	8,569		5,720	66	162	12,461	8,753	
1943	281	18	115	12,091	51,764		6,546	757	255	15,933	9,526	
1944	419	10	78	4,049	26,711		6,419	857	884	17,288	11,987	

TABLE 4.5 (Continued)

YEAR	DIPHTHERIA	SMALLPOX	TYPHOID FEVER	WHOOPING COUGH	MEASLES	HEPATITIS, ALL TYPES	TB[2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS[1]	POLIO	SYPHILIS	GONORRHEA	ACQUIRED IMMUNE DEFICIENCY SYNDROME
1945	630	16	59	5,339	6,328	134	5,471	270	215	16,046	12,565	
1946	385	3	85	8,116	42,261	34	5,548	185	1,091	18,051	12,635	
1947	238	1	77	10,472	9,574	14	6,470	113	646	15,276	10,989	
1946	126	-	49	2,668	42,952	9	6,109	107	775	12,100	9,448	
1949	119	-	48	4,157	20,279	28	5,953	120	2,909	8,740	9,427	
1950	84	-	43	9,184	38,245	48	5,538	133	2,029	8,830	8,678	
1951	48	-	33	3,156	15,227	325	6,144	138	1,463	6,532	8,494	
1952	45	1	53	1,992	32,941	283	6,152	169	3,912	7,377	7,691	
1953	12	-	31	2,932	23,334	868	5,643	151	2,346	5,619	8,790	
1954	57	-	30	5,620	40,725	1,419	5,764	150	2,168	4,686	9,940	
1955	59	-	24	4,249	23,882	1,244	5,488	170	1,177	4,865	10,306	
1956	220	-	56	1,907	41,966	814	5,515	182	656	4,785	9,598	
1957	130	-	12	1,363	19,070	657	5,011	175	498	4,571	8,428	
1958	6	-	18	1,233	41,448	688	5,587	228	1,228	4,267	8,621	
1959	3	-	8	3,001	12,234	1,136	4,743	141	448	3,421	8,033	
1960	9	-	14	1,129	36,161	2,113	4,127	169	88	3,647	8,372	
1961	3	-	7	639	29,391	4,607	3,838	253	40	3,309	9,505	
1962	4		12	1,756	25,303	3,280	3,474	139	21	4,331	11,654	
1963	5	-	14	1,410	48,752	2,661	3,298	104	18	5,512	11,043	
1964	1	-	13	957	30,897	2,472	3,047	80	3	5,220	12,028	
1965	-	-	7	612	28,132	2,625	3,069	107	1	5,638	14,319	
1966	1	-	7	653	15,251	2,589	3,259	135	1	5,842	15,424	
1967	1	-	8	1,05[illegible]	1,048	1,915	2,951	76	3	5,581	17,088	
1968	-	-	1	429	353	2,356	2,618	94	3	5,351	18,153	
1969	-	-	6	192	401	3,359	2,133	114	1	3,809	18,534	
1970	-	-	14	195	1,834	4,594	1,992	69	2	3,920	20,359	
1971	1	-	10	140	2,659	4,828	1,789	64	-	4,800	22,260	
1972	1	-	7	116	2,353	4,322	1,632	55	1	4,891	24,750	
1973	-	-	14	86	4,552	3,872	1,473	54	-	4,375	31,086	
1974	-	-	11	104	2,365	3,599	1,431	54	2	2,722	32,067	
1975	1	-	10	98	3,253	2,877	1,271	76	-	1,638	32,583	
1976	-	-	10	70	6,139	2,645	1,349	65	1	1,089	34,836	
1977	-	-	13	73	1,392	2,686	1,290	51	-	1,185	36,794	
1978	-	-	15	47	8,006	2,174	1,260	87	1	1,133	36,647	
1979	-	-	14	102	869	2,036	1,052	79	-	1,260	36,624	
1980	1	-	12	38	250	1,799	1,168	77	1	1,163	34,951	
1981	-	-	26	30	34	1,700	931	93	-	1,053	32,524	2
1982	-	-	14	34	64	1,745	864	81	-	921	32,848	2
1983	-	-	10	43	8	1,788	790	91	-	731	34,065	16
1984	-	-	9	31	464	1,728	661	90	-	749	34,839	42
1985	-	-	8	54	60	1,490	535	107	-	656	33,516	85
1986	-	-	5	35	106	1,266	619	81	-	584	37,929	146

[1] -Meningococcal infections - Prior to 1952 data were for meningococcic meningitis.

[2] -Effective January 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, case counts and rates prior to 1975 are not directly comparable to the figures in 1975 and later years.

SOURCE: Bureau of Disease Control and Laboratory Services, Division of Epidemiology, MDPH.

TABLE 4.8
CASE RATES OF CERTAIN REPORTED COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1986
(Rates per 100,000 population)

YEAR	DIPH-THERIA	SMALL-POX	TYPHOID FEVER	WHOOP-ING COUGH	MEASLES	HEPATI-TIS, ALL TYPES	TB* (ALL FORMS)	MENIN-GOCOC-CAL INFEC-TIONS	POLIO	SYPHI-LIS	GONOR-RHEA	ACQUIRED IMMUNE DEFICIENCY SYNDROME
1900	111.8	28.7	211.6	139.4	840.8		112.4	27.0				
1901	101.5	206.8	122.0	120.1	188.2		118.5	20.6				
1902	119.8	283.6	98.3	141.4	479.3		106.4	21.1				
1903	144.6	249.9	111.9	164.4	352.3		108.2	20.7				
1904	136.2	223.3	117.5	69.0	403.1		113.6	17.4				
1905	82.5	114.1	106.1	45.7	231.7		99.0	22.1				
1906	137.4	46.7	119.2	51.4	278.9		99.9	20.1				
1907	109.0	63.5	72.5	32.4	450.7		100.2	21.3				
1908	97.3	84.4	97.2	45.7	174.8		99.0	17.8				
1909	112.2	55.3	97.2	38.0	326.5		123.5	16.5				
1910	122.2	118.1	119.6	40.4	495.8		157.1	18.6	3.7			
1911	129.9	31.0	91.8	65.5	332.8		181.4	16.5	2.3			
1912	110.5	37.8	95.5	42.1	95.0		65.7	3.0	2.6			
1913	179.5	65.0	73.4	30.3	299.4		62.6	5.4	1.8			
1914	163.3	48.4	68.7	57.8	360.1		81.4	6.5	1.6			
1915	135.4	33.8	60.4	69.7	137.0		112.6	3.3	2.9			
1916	169.2	47.5	75.6	55.2	365.2		212.8	4.9	18.0			
1917	249.2	107.7	50.5	94.1	424.3		142.4	2.2	2.7			
1918	175.2	149.9	38.3	73.3	192.4		104.5	2.7	3.5			
1919	220.4	66.5	35.0	51.1	248.0		118.1	2.1	4.3	141.7	220.8	
1920	282.4	131.3	38.7	195.5	609.6		136.1	5.5	1.8	221.3	312.5	
1921	318.9	119.2	43.5	176.9	80.4		150.8	4.6	12.8	196.0	258.2	
1922	218.1	31.5	28.4	144.5	310.2		142.8	4.1	1.1	202.4	248.9	
1923	192.1	57.5	24.4	189.5	747.2		136.1	4.6	1.0	260.7	238.7	
1924	145.3	109.4	18.9	105.5	442.0		134.6	3.8	15.6	314.2	253.5	
1925	92.2	18.4	22.6	178.0	242.8		135.8	3.0	2.3	344.7	250.5	
1926	123.0	12.6	13.3	200.7	913.5		123.2	2.2	2.4	340.1	244.9	
1927	101.9	32.7	12.9	151.8	184.9		120.4	3.1	6.3	349.9	207.5	
1928	80.8	29.0	8.5	210.5	586.9		127.7	6.0	1.7	332.6	186.5	
1929	97.7	51.0	6.6	197.7	381.8		132.2	39.4	3.8	351.4	204.5	
1930	66.2	49.0	10.4	163.9	580.9		105.9	18.6	4.3	341.5	176.6	
1931	37.5	18.7	8.7	234.4	127.2		125.6	6.0	23.3	300.2	160.6	
1932	24.1	4.5	10.4	265.8	855.4		144.2	2.6	2.3	243.0	141.4	
1933	23.2	0.9	9.1	236.0	436.0		133.4	1.7	1.9	154.9	129.8	
1934	12.3	1.0	9.7	224.8	130.4		105.1	1.1	4.6	129.5	123.6	
1935	12.8	0.3	7.0	265.6	1,565.8		91.9	2.2	12.2	127.1	126.2	
1936	13.0	0.6	8.8	280.7	48.2		101.3	2.4	3.0	125.7	126.9	
1937	16.4	3.0	4.7	222.6	118.9		126.1	1.7	8.2	169.7	137.8	
1938	12.0	5.3	5.5	281.5	1,534.8		122.5	1.3	1.1	283.8	136.2	
1939	8.7	7.1	3.4	172.5	248.3		117.3	0.9	17.3	252.0	122.0	
1940	9.0	1.4	2.3	223.7	384.4		119.3	0.8	23.4	190.2	145.9	
1941	4.5	2.1	2.7	303.7	1,301.1		98.8	0.9	5.0	209.1	161.2	
1942	4.4	0.3	1.3	209.5	154.7		103.3	1.2	2.9	225.0	158.0	
1943	5.2	0.3	2.1	224.8	962.6		121.7	14.1	4.7	296.3	177.1	

TABLE 4.8 (Continued)

Year	DIPHTHERIA	SMALLPOX	TYPHOID FEVER	WHOOPING COUGH	MEASLES	HEPATITIS, ALL TYPES	TB[2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS[1]	POLIO	SYPHILIS	GONORRHEA	ACQUIRED IMMUNE DEFICIENCY SYNDROME
1944	7.8	0.2	1.5	75.3	496.7		119.4	15.9	16.4	321.5	222.9	
1945	11.6	0.3	1.1	98.2	116.4	2.5	100.7	5.0	4.0	295.2	231.2	
1946	6.7	0.1	1.5	142.2	740.3	0.6	97.2	3.2	19.1	316.2	221.3	
1947	3.9	0.0	1.3	172.5	157.8	0.2	106.6	1.9	10.6	251.7	181.1	
1948	2.0	-	0.8	43.1	693.3	0.1	98.6	1.7	12.5	195.3	152.5	
1949	1.9	-	0.8	65.4	319.3	0.4	93.7	1.9	45.8	137.6	148.4	
1950	1.3	-	0.7	144.1	600.2	0.8	86.9	2.1	31.8	138.6	136.2	
1951	0.7	-	0.5	48.2	232.7	5.0	93.3	2.1	22.4	99.8	129.8	
1952	0.7	-	0.8	29.7	491.1	4.2	91.7	2.5	58.3	110.0	114.7	
1953	0.2	-	0.5	42.8	340.5	12.7	82.4	2.2	34.2	82.0	128.3	
1954	0.8	-	0.4	80.0	579.8	20.2	82.1	2.1	30.9	66.7	141.5	
1955	0.8	-	0.3	58.7	330.0	17.2	75.8	2.3	16.3	67.2	142.4	
1956	2.9	-	0.7	25.4	558.4	10.8	73.4	2.4	8.7	63.7	127.7	
1957	1.7	-	0.2	17.5	244.4	8.4	64.2	2.2	6.4	58.6	108.0	
1958	0.1	-	0.2	15.7	526.9	8.7	71.0	2.9	15.6	54.2	109.6	
1959	0.0	-	0.1	37.7	153.7	14.3	59.6	1.8	5.6	43.0	100.9	
1960	0.1	-	0.2	14.4	462.2	27.0	52.8	2.2	1.1	46.6	107.0	
1961	0.0	-	0.1	8.1	371.9	58.3	48.6	3.2	0.5	41.9	120.3	
1962	0.1	-	0.2	22.1	318.7	41.3	43.8	1.8	0.3	54.6	146.8	
1963	0.1	-	0.2	17.6	607.1	33.1	41.1	1.3	0.2	68.6	137.5	
1964	0.0	-	0.2	11.8	381.4	30.5	37.6	1.0	0.0	64.4	148.5	
1965	-	-	0.1	7.5	343.1	32.0	37.4	1.3	0.0	68.8	174.6	
1966	0.0	-	0.1	7.9	183.4	31.1	39.2	1.6	0.0	70.3	185.5	
1967	0.0	-	0.1	12.3	12.2	22.2	34.2	0.9	0.0	64.8	198.4	
1968	-	-	0.0	4.9	4.1	27.2	30.2	1.1	0.0	61.7	209.3	
1969	-	-	0.1	2.2	4.6	38.5	24.4	1.3	0.0	43.6	212.2	
1970	-	-	0.2	2.2	20.7	51.8	22.4	0.8	0.0	44.2	229.4	
1971	0.0	-	0.1	1.6	28.6	53.8	19.8	0.7	-	53.5	248.1	
1972	0.0	-	0.1	1.3	26.1	47.9	18.1	0.6	0.0	54.2	274.2	
1973	-	-	0.2	0.6	50.2	42.7	16.2	0.6	-	48.2	342.7	
1974	-	-	0.1	1.1	26.0	39.5	15.7	0.6	0.0	29.9	352.0	
1975	0.0	-	0.1	1.1	35.7	31.6	14.0	0.8	-	18.0	357.7	
1976	-	-	0.1	0.8	67.3	28.0	14.8	0.7	0.0	11.8	382.1	
1977	-	-	0.1	0.8	15.2	29.3	14.1	0.6	-	12.9	401.8	
1978	-	-	0.2	0.5	87.0	23.6	13.7	0.9	0.0	12.3	398.3	
1979	-	-	0.2	1.1	8.4	22.0	11.4	0.9	-	13.6	396.0	
1980	0.0	-	0.1	0.4	2.7	19.4	12.6	0.8	0.0	12.6	377.4	
1981	-	-	0.3	0.3	0.4	18.3	10.0	1.0	-	11.4	350.9	0.0
1982	-	-	0.2	0.4	0.7	18.9	9.4	0.9	-	10.0	356.0	0.0
1983	-	-	0.1	0.5	0.1	19.5	8.6	1.0	-	8.0	372.1	0.2
1984	-	-	0.1	0.3	5.1	19.0	7.3	1.0	-	8.3	383.9	0.5
1985	-	-	0.1	0.6	0.7	16.4	5.9	1.2	-	7.2	368.8	0.9
1986	-	-	0.1	0.4	0.2	13.8	6.8	0.9	-	6.4	414.8	1.6

[1] -Meningococcal infections - Prior to 1952 data were for meningococcic meningitis.

[2] -Effective January, 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, case counts and rates prior to 1975 are not directly comparable to the figures in 1975 and later years.

SOURCE: Bureau of Disease Control and Laboratory Services, Division of Epidemiology, MDPH

TABLE 4.7
NUMBER OF DEATHS AND DEATH RATES FOR CERTAIN COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1986
(Rates per 100,000 population)

Year	Diphtheria		Strep. Sore Throat Incl. Scarlet Fever		Smallpox		Typhoid Fever		Whooping Cough		Measles		TB of the Respiratory System		Tuberculosis' (all forms)		Polio-myelitis		Syphilis'		Gonorrhea	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1900	529	21.9	272	11.2	9	0.4	869	35.9	208	8.6	342	14.1	2,018	83.4	2,500	103.3						
1901	502	20.4	312	12.7	27	1.1	645	26.2	163	6.6	79	3.2	2,152	87.5	2,548	103.6			88	3.6		
1902	504	20.2	277	11.1	42	1.7	608	24.3	289	11.6	238	9.5	2,088	83.6	2,462	98.5			114	4.6		
1903	686	27.0	200	7.9	29	1.1	606	23.9	383	15.1	176	6.9	2,155	84.9	2,562	101.0			130	5.2		
1904	515	20.0	210	8.1	26	1.0	641	24.9	148	5.7	194	7.5	2,306	89.5	2,761	107.2			101	4.0		
1905	478	18.3	123	4.7	74	2.8	636	24.3	131	5.0	123	4.7	2,288	87.5	2,732	104.5			89	3.5		
1906	472	17.8	227	8.6	3	0.1	721	27.2	469	17.7	251	9.5	2,303	86.8	2,737	103.1			89	3.4		
1907	421	15.6	159	5.9	8	0.3	594	22.1	223	8.3	256	9.5	2,338	86.8	2,728	101.3			94	3.6		
1908	343	12.6	194	7.1	11	0.4	687	25.1	305	11.2	121	4.4	2,249	82.3	2,706	99.0			118	4.5		
1909	395	14.3	275	9.9	4	0.1	653	23.6	217	7.8	270	9.7	2,237	80.7	2,629	94.9			127	4.8		
1910	495	17.6	297	10.6	121	4.3	654	23.3	318	11.3	251	8.9	2,273	80.9	2,756	98.1	52	1.9	65	2.3		
1911	473	16.3	208	7.2	7	0.2	551	19.0	254	8.8	200	6.9	2,284	78.9	2,766	95.5	55	1.9	104	3.6		
1912	465	15.6	186	6.2	3	0.1	534	17.9	252	8.5	118	4.0	2,289	76.8	2,744	92.0	48	1.7	90	3.1		
1913	676	22.0	283	9.2	5	0.2	538	17.5	292	9.5	258	8.4	2,243	73.1	2,703	88.1	43	1.5	136	4.6		
1914	507	16.1	177	5.6	2	0.1	400	12.7	304	9.6	180	5.7	2,325	73.7	2,799	88.8	41	1.4	160	5.3		
1915	354	10.9	107	3.3	5	0.2	353	10.9	236	7.3	101	3.1	2,527	78.0	2,986	92.2	36	1.2	163	5.3		
1916	507	15.2	177	5.3	2	0.1	424	12.8	228	6.9	363	10.9	2,573	77.4	3,070	92.3	141	4.6	206	6.7		
1917	851	24.9	340	10.0	9	0.3	386	11.3	360	10.6	259	7.6	2,779	81.5	3,310	97.0	44	1.4	224	7.1		
1918	686	19.6	181	5.2	18	0.5	337	9.6	496	14.2	270	7.7	3,059	87.5	3,612	103.3	58	1.8	290	9.1		
1919	764	21.3	179	5.0	10	0.3	272	7.6	172	4.8	183	5.1	2,620	73.1	3,127	87.3	80	2.2	299	8.2		
1920	888	24.2	305	8.3	14	0.4	297	8.1	511	13.9	436	11.9	2,645	72.1	3,149	85.8	30	0.8	314	8.4		
1921	954	25.2	334	8.8	12	0.3	285	7.5	316	8.3	58	1.5	2,285	60.4	2,736	72.3	100	2.6	226	5.9	14	0.4
1922	620	15.9	217	5.6	20	0.5	192	4.9	232	5.9	232	5.9	2,232	57.2	2,654	68.0	21	0.5	186	4.7	6	0.2
1923	675	16.8	304	7.6	13	0.3	202	5.0	323	8.0	258	6.4	2,410	59.9	2,837	70.6	18	0.5	262	6.8	5	0.1
1924	470	11.4	265	6.4	226	5.5	149	3.6	169	4.1	221	5.3	2,474	59.8	2,952	71.3	116	3.0	271	7.0	13	0.3
1925	358	8.4	208	4.9	22	0.5	157	3.7	260	6.1	69	1.6	2,410	56.6	2,830	66.5	31	0.7	282	6.6	27	0.6
1926	677	15.5	235	5.4	4	0.1	119	2.7	355	8.1	577	13.2	2,601	59.5	3,041	69.5	34	0.8	327	7.5	12	0.3
1927	516	11.5	168	3.7	-	-	94	2.1	201	4.5	67	1.5	2,514	56.0	2,952	65.7	69	1.5	305	6.8	16	0.4
1928	384	8.3	178	3.9	2	0.0	83	1.8	219	4.8	303	6.6	2,647	57.4	3,108	67.5	27	0.6	384	8.4	19	0.4
1929	498	10.5	145	3.1	9	0.2	81	1.7	255	5.4	146	3.1	2,685	56.8	3,140	66.5	50	1.1	397	8.4	19	0.4
1930	299	6.2	130	2.7	9	0.2	87	1.8	176	3.6	231	4.8	2,443	50.5	2,912	60.1	39	0.8	395	8.2	12	0.2
1931	172	3.5	122	2.5	4	0.1	73	1.5	190	3.9	28	0.6	2,263	46.3	2,660	54.5	108	2.2	361	7.4	3	0.1
1932	106	2.2	112	2.3	1	0.0	56	1.1	199	4.0	183	3.7	2,101	42.7	2,463	50.0	23	0.5	377	7.7	2	0.0
1933	112	2.3	157	3.2	-	-	50	1.0	153	3.1	111	2.2	1,996	40.2	2,348	47.3	5	0.1	327	6.6	7	0.1
1934	38	0.8	171	3.4	-	-	65	1.3	141	2.8	36	0.7	1,909	38.1	2,199	43.9	25	0.5	402	8.0	10	0.2
1935	58	1.1	98	1.9	-	-	34	0.7	132	2.6	184	3.6	1,741	34.5	2,044	40.5	32	0.6	393	7.8	3	0.1
1936	52	1.0	114	2.2	-	-	37	0.7	107	2.1	12	0.2	1,816	35.7	2,100	41.3	21	0.4	394	7.7	6	0.1
1937	72	1.4	148	2.9	1	0.0	29	0.6	132	2.6	11	0.2	1,860	36.2	2,119	41.3	51	1.0	401	7.8	8	0.2
1938	44	0.9	87	1.7	-	-	23	0.4	116	2.2	100	1.9	1,633	31.6	1,866	36.1	10	0.2	401	7.8	8	0.2
1939	25	0.5	69	1.3	-	-	25	0.5	76	1.5	29	0.6	1,651	31.7	1,881	36.1	40	0.8	389	7.5	4	0.1
1940	20	0.4	41	0.8	1	0.0	11	0.2	59	1.1	19	0.4	1,547	29.4	1,752	33.3	72	1.4	591	11.2	3	0.0
1941	18	0.3	32	0.6	1	0.0	14	0.3	91	1.7	65	1.2	1,532	28.2	1,723	31.7	18	0.3	537	9.9	1	0.0
1942	24	0.4	23	0.4	-	-	5	0.1	72	1.3	8	0.1	1,630	29.4	1,827	33.0	10	0.2	559	10.1	7	0.1
1943	21	0.4	11	0.2	-	-	9	0.2	101	1.9	89	1.7	1,588	29.5	1,802	33.5	27	0.5	579	10.8	3	0.0
1944	32	0.6	7	0.1	1	0.0	7	0.1	33	0.6	49	0.9	1,544	28.7	1,748	32.5	45	0.8	543	10.1	2	0.0

TABLE 4.7 (Continued)

Year	Diphtheria		Strep. Sore Throat Incl. Scarlet Fever		Smallpox		Typhoid Fever		Whooping Cough		Measles		TB of the Respiratory System		Tuberculosis[2] (all forms)		Polio-myelitis		Syphilis[1]		Gonorrhea	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1945	46	0.8	9	0.2	-	-	3	0.1	36	0.7	10	0.2	1,591	29.3	1,758	32.3	20	0.4	527	9.7	2	0.0
1946	27	0.5	3	0.1	-	-	6	0.1	44	0.8	47	0.8	1,645	28.8	1,843	32.3	89	1.6	547	9.6	-	-
1947	23	0.4	6	0.1	-	-	5	0.1	63	1.0	5	0.1	1,483	24.4	1,643	27.1	29	0.5	502	8.3	3	0.0
1948	8	0.1	1	0.0	-	-	4	0.1	9	0.1	43	0.7	1,395	22.5	1,561	25.2	54	0.9	512	8.3	-	-
1949	11	0.2	4	0.1	-	-	1	0.0	22	0.3	33	0.5	1,254	19.7	1,400	22.0	216	3.4	455	7.2	-	-
1950	2	0.0	1	0.0	-	-	5	0.1	28	0.4	28	0.4	1,134	17.8	1,270	19.9	128	2.0	325	5.1	1	0.0
1951	6	0.1	-	-	-	-	1	0.0	21	0.3	11	0.2	1,049	16.0	1,154	17.6	67	1.0	299	4.6	1	0.0
1952	2	0.0	-	-	-	-	-	-	8	0.1	17	0.3	689	10.3	775	11.6	213	3.2	174	2.6	2	0.0
1953	2	0.0	1	0.0	-	-	-	-	11	0.2	16	0.2	536	7.8	607	8.9	108	1.6	182	2.7	1	0.0
1954	3	0.0	3	0.0	-	-	-	-	17	0.2	17	0.2	471	6.7	530	7.5	89	1.3	139	2.0	2	0.0
1955	1	0.0	1	0.0	-	-	1	0.0	8	0.1	10	0.1	435	6.0	477	6.6	32	0.4	115	1.6	1	0.0
1956	6	0.1	3	0.0	-	-	-	-	6	0.1	26	0.3	426	5.7	466	6.2	22	0.3	114	1.5	4	0.1
1957	1	0.0	-	-	-	-	-	-	6	0.1	23	0.3	403	5.2	442	5.7	15	0.2	105	1.3	4	0.1
1958	-	-	-	-	-	-	-	-	1	0.0	18	0.2	357	4.5	395	5.0	37	0.5	84	1.1	8	0.1
1959	1	0.0	2	0.0	-	-	1	0.0	5	0.1	11	0.1	335	4.2	370	4.6	17	0.2	84	1.1	4	0.1
1960	2	0.0	1	0.0	-	-	-	-	1	0.0	17	0.2	364	4.7	390	5.0	4	0.1	79	1.0	7	0.1
1961	1	0.0	1	0.0	-	-	-	-	2	0.0	13	0.2	307	3.9	332	4.2	-	-	71	0.9	7	0.1
1962	2	0.0	1	0.0	-	-	-	-	2	0.0	8	0.1	307	3.9	331	4.2	2	0.0	94	1.2	3	0.0
1963	-	-	-	-	-	-	-	-	-	-	27	0.3	276	3.4	299	3.7	1	0.0	72	0.9	1	0.0
1964	-	-	-	-	-	-	-	-	2	0.0	11	0.1	288	3.6	315	3.9	1	0.0	66	0.8	3	0.0
1965	-	-	-	-	-	-	-	-	-	-	5	0.1	261	3.2	285	3.5	-	-	65	0.8	2	0.0
1966	1	0.0	-	-	-	-	-	-	-	-	7	0.1	284	3.4	301	3.6	-	-	63	0.8	-	-
1967	-	-	-	-	-	-	-	-	-	-	3	0.0	206	2.4	226	2.6	-	-	44	0.5	1	0.0
1968	-	-	1	0.0	-	-	-	-	-	-	-	-	203	2.3	262	3.0	2	0.0	29	0.3	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	147	1.7	201	2.3	-	-	26	0.3	1	0.0
1970	-	-	2	0.0	-	-	-	-	-	-	1	0.0	134	1.5	180	2.0	-	-	17	0.2	2	0.0
1971	-		4	0.0	-	-	-	-	-	-	-	-	122	1.4	173	1.9	-	-	18	0.2	-	-
1972	-	-	1	0.0	-	-	1	0.0	-	-	-	-	111	1.2	157	1.7	1	0.0	12	0.1	-	-
1973	-	-	-	-	-	-	-	-	1	0.0	2	0.0	101	1.1	138	1.5	3	0.0	12	0.1	-	-
1974	-	-	1	0.0	-	-	-	-	2	0.0	-	-	109	1.2	142	1.6	3	0.0	11	0.1	-	-
1975	-	-	-	-	-	-	-	-	1	0.0	1	0.0	81	0.9	110	1.2	5	0.1	10	0.1	1	0.0
1976	-	-	-	-	-	-	-	-	-	-	-	-	80	0.9	102	1.1	6	0.1	11	0.1	-	-
1977	-	-	1	0.0	-	-	-	-	-	-	-	-	67	0.7	97	1.1	6	0.1	3	0.0	-	-
1978	-	-	-	-	-	-	-	-	1	0.0	1	0.0	60	0.7	80	0.9	2	0.0	5	0.1	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	47	0.5	62	0.7	2	0.0	9	0.1	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-	51	0.6	61	0.7	-	-	1	0.0	1	0.0
1981	-	-	-	-	-	-	1	0.0	-	-	-	-	41	0.4	53	0.6	-	-	4	0.0	1	0.0
1982	-	-	-	-	-	-	-	-	-	-	1	0.0	30	0.3	41	0.4	-	-	-	-	-	-
1983	-	-	1	0.0	-	-	-	-	-	-	1	0.0	28	0.3	39	0.4	-	-	3	0.0	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	47	0.5	59	0.7	-	-	2	0.0	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	37	0.4	46	0.5	-	-	3	0.0	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	36	0.4	44	0.5	-	-	2	0.0	-	-

[1] -From 1901 through 1920, syphilis includes all other venereal diseases, beginning with 1968 excludes aortic aneurysms not specified as syphilitic.

[2] -Effective January 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, deaths and rates prior to 1975 are not directly comparable to the figures in 1975 and later years.

TABLE 4.8

NUMBER OF DEATHS AND DEATH RATES BY SPECIFIED CAUSES, MICHIGAN RESIDENTS, 1900-1986

(Rates per 100,000 population)

Year	Heart Disease		Cancer (all forms)[1]		Cerebrovascular Disease[2]		Accidents (all forms)[3]		Motor Vehicle Accidents[4]		Diabetes		Pneumonia		Chronic Liver Disease & Cirrhosis[5]		Athero-sclerosis[6]	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1900	2,836	117.1	1,460	60.3	2,136	88.2	1,740	71.9			224	9.3	2,388	98.6				
1901	3,040	123.6	1,484	60.3	2,147	87.3	1,901	77.3			264	10.7	2,901	117.9				
1902	3,302	132.1	1,483	59.3	2,097	83.9	1,796	71.9			289	11.6	2,637	105.5				
1903	3,702	145.9	1,694	66.8	2,321	91.5	2,017	79.5			265	10.4	2,607	102.7				
1904	3,981	154.5	1,728	67.1	2,431	94.3	2,035	79.0			298	11.6	2,646	102.7				
1905	3,715	142.0	1,693	64.7	2,405	91.9	2,034	77.8			267	10.2	2,417	92.4				
1906	3,933	148.2	1,736	65.4	2,554	96.2	2,126	80.1			311	11.7	2,621	98.7				
1907	4,269	158.5	1,747	64.9	2,690	99.9	2,209	82.0			352	13.1	3,018	112.0				
1908	4,202	153.8	1,921	70.3	2,630	96.3	2,036	74.5			359	13.1	2,313	84.7				
1909	4,354	157.1	1,948	70.3	2,739	98.8	1,903	68.7			374	13.5	2,265	81.7				
1910	4,581	163.0	2,105	74.9	3,091	110.0	2,158	76.8	49	1.7	398	14.2	2,785	99.1	282	10.0		
1911	4,639	160.2	2,142	74.0	2,916	100.7	2,121	73.2	44	1.5	373	12.9	2,763	95.4				
1912	5,324	178.5	2,291	76.8	2,707	90.8	2,005	67.2	75	2.5	448	15.0	2,796	93.8				
1913	4,908	160.0	2,388	77.8	2,834	92.4	2,333	76.1	132	4.3	483	15.7	3,082	100.5				
1914	5,124	162.5	2,414	76.6	2,993	94.9	2,108	66.8	120	3.8	503	16.0	2,909	92.2				
1915	5,538	171.0	2,567	79.2	3,384	104.5	2,219	68.5	190	5.9	498	15.4	3,229	99.7				
1916	5,819	175.0	2,710	81.5	3,559	107.0	2,853	85.8	257	7.7	500	15.0	3,698	111.2				
1917	6,103	178.9	2,765	81.1	3,703	108.6	2,925	85.8	335	9.8	569	16.7	4,455	130.6				
1918	6,091	174.2	2,931	83.8	3,493	99.9	2,599	74.3	279	8.0	591	16.9	7,238	207.0				
1919	5,651	157.7	2,990	83.5	3,483	97.2	2,612	72.9	328	9.2	559	15.6	4,081	113.9				
1920	6,732	183.5	3,158	86.1	3,876	105.7	2,646	72.1	397	10.8	577	15.7	5,794	157.9				
1921	6,176	163.1	3,373	89.1	3,931	103.8	2,476	65.4	403	10.6	586	15.5	2,849	75.3	261	6.9		
1922	6,897	176.7	3,481	89.2	4,041	103.5	2,475	63.4	529	13.6	650	16.7	3,728	95.5	267	6.8		
1923	7,266	180.7	3,545	88.2	4,420	109.9	2,826	70.3	677	16.8	635	15.8	4,719	117.4	251	6.2		
1924	6,985	168.8	3,824	92.4	4,241	102.5	3,090	74.7	1,001	24.2	661	16.0	3,332	80.5	256	6.2		
1925	7,540	177.2	3,858	90.7	4,623	108.6	3,278	77.0	1,103	25.9	746	17.5	3,294	77.4	319	7.5		
1926	8,281	189.4	4,087	93.5	4,663	106.6	3,557	81.3	1,221	27.9	743	17.0	4,440	101.5	326	7.5		
1927	8,780	195.5	4,264	95.0	4,378	97.5	3,634	80.9	1,389	30.9	819	18.2	3,543	78.9	340	7.6		
1928	9,786	212.4	4,381	95.1	4,718	102.4	3,704	80.4	1,429	31.0	905	19.6	4,518	98.1	373	8.1		
1929	10,185	215.6	4,571	96.7	4,694	99.3	3,913	82.8	1,552	32.8	935	19.8	4,216	89.2	361	7.6		
1930	9,947	205.4	4,572	94.4	4,533	93.6	3,805	78.6	1,572	32.5	880	18.2	3,321	68.6	329	6.8	1,047	21.6
1931	10,206	209.0	4,763	97.5	4,388	89.8	3,630	74.3	1,516	31.0	950	19.5	2,883	59.0	365	7.5	1,005	20.6
1932	11,162	226.6	4,935	100.2	4,518	91.7	3,179	64.5	1,229	25.0	1,121	22.8	3,238	65.7	386	7.8	948	19.2
1933	11,509	231.7	5,055	101.8	4,318	86.9	3,304	66.5	1,278	25.7	1,103	22.2	2,756	55.5	354	7.1	966	19.5
1934	11,824	236.1	5,370	107.2	4,485	89.6	3,774	75.4	1,511	30.2	1,100	22.0	3,466	69.2	378	7.5	914	18.3
1935	12,456	246.7	5,399	106.9	4,420	87.5	3,771	74.7	1,676	33.2	1,228	24.3	3,801	75.3	368	7.3	897	17.8
1936	13,374	262.7	5,752	113.0	4,705	92.4	5,246	103.1	1,924	37.8	1,266	24.9	4,096	80.5	446	8.8	997	19.6
1937	13,233	257.8	5,732	111.7	4,378	85.3	4,580	89.2	2,187	42.6	1,255	24.5	4,098	79.8	430	8.4	1,168	22.8
1938	13,887	268.4	6,059	117.1	4,543	87.8	3,608	69.7	1,490	28.8	1,283	24.8	2,869	55.5	424	8.2	869	16.8
1939	14,898	285.7	6,296	120.7	4,415	84.7	3,761	72.1	1,553	29.8	1,360	26.1	2,803	53.8	387	7.4	918	17.6
1940	15,480	294.5	6,513	123.9	4,690	89.2	3,961	75.4	1,743	33.2	1,408	26.8	2,478	47.1	468	8.9	941	17.9
1941	15,761	289.8	6,551	120.5	4,698	86.4	4,450	81.8	2,156	39.6	1,382	25.4	2,235	41.1	450	8.3	906	16.7
1942	16,016	289.2	6,646	120.0	4,841	87.4	3,685	66.5	1,368	24.7	1,448	26.1	2,349	42.4	535	9.7	1,015	18.3
1943	17,816	331.3	7,127	132.5	5,311	98.8	3,480	64.7	1,025	19.1	1,535	28.5	2,931	54.5	518	9.6	1,092	20.3
1944	17,004	316.2	7,277	135.3	4,954	92.1	3,350	62.3	1,103	20.5	1,554	28.9	2,369	44.1	471	8.8	980	18.2

TABLE 4.8, 1900-1986 (Continued)

Year	Heart Disease		Cancer (all forms)[1]		Cerebrovascular Disease[2]		Accidents (all forms)[3]		Motor Vehicle Accidents[4]		Diabetes		Pneumonia		Chronic Liver Disease & Cirrhosis[5]		Athero-sclerosis[6]	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1945	17,421	320.5	7,486	137.7	5,295	97.4	3,432	63.1	1,199	22.1	1,561	28.7	1,932	35.5	535	9.8	970	17.8
1946	17,691	309.9	7,845	137.4	5,224	91.5	3,776	66.1	1,506	26.4	1,530	26.8	1,891	33.1	554	9.7	933	16.3
1947	18,412	303.4	8,188	134.9	5,426	89.4	3,848	63.4	1,499	24.7	1,618	26.7	2,089	34.4	697	11.5	1,031	17.0
1948	18,726	302.3	8,336	134.6	5,272	85.1	4,017	64.8	1,545	24.9	1,771	28.6	1,853	29.9	771	12.4	1,085	17.5
1949	19,137	301.3	8,697	136.9	5,438	85.6	3,838	60.4	1,493	23.5	1,884	29.7	1,885	29.7	730	11.5	1,135	17.9
1950	20,521	322.1	8,685	136.3	6,376	100.1	3,783	59.4	1,680	26.4	1,438	22.6	1,358	21.3	616	9.7	1,296	20.3
1951	21,118	322.6	9,187	140.4	6,579	100.5	3,916	59.8	1,806	27.6	1,374	21.0	1,619	24.7	569	8.7	1,312	20.0
1952	21,247	316.8	9,256	138.0	6,521	97.2	3,901	58.2	1,815	27.1	1,339	20.0	1,571	23.4	599	8.9	1,294	19.3
1953	22,425	327.3	9,904	144.5	7,045	102.8	4,375	63.8	2,051	29.9	1,419	20.7	1,538	22.4	715	10.4	1,270	18.5
1954	22,362	318.4	10,105	143.9	6,964	99.1	3,948	56.2	1,916	27.3	1,469	20.9	1,380	19.6	677	9.6	1,170	16.7
1955	23,440	323.9	10,297	142.3	7,362	101.7	4,213	58.2	2,129	29.4	1,415	19.6	1,538	21.3	805	11.1	1,237	17.1
1956	24,661	328.1	10,489	139.6	7,114	94.7	3,925	52.2	1,826	24.3	1,443	19.2	1,723	22.9	788	10.5	1,251	16.6
1957	25,369	325.1	10,810	138.5	7,632	97.8	3,643	46.7	1,680	21.5	1,510	19.4	2,045	26.2	861	11.0	1,248	16.0
1958	25,215	320.6	10,946	139.2	7,547	95.9	3,306	42.0	1,466	18.6	1,595	20.3	2,076	26.4	818	10.4	1,300	16.5
1959	25,323	318.1	11,113	139.6	7,700	96.7	3,666	46.1	1,587	19.9	1,715	21.5	1,810	22.7	815	10.2	1,403	17.6
1960	25,728	328.9	11,331	144.8	7,682	98.2	3,688	47.1	1,710	21.9	1,784	22.8	2,002	25.6	840	10.7	1,352	17.3
1961	25,519	322.9	11,476	145.2	7,745	98.0	3,692	46.7	1,656	21.0	1,778	22.5	1,692	21.4	858	10.9	1,448	18.3
1962	27,226	342.9	11,752	148.0	7,783	98.0	3,758	47.3	1,668	21.0	1,908	24.0	1,824	23.0	859	10.8	1,477	18.6
1963	27,483	342.3	12,078	150.4	8,168	101.7	4,033	50.2	2,005	25.0	2,049	25.5	1,995	24.8	958	11.9	1,652	20.6
1964	27,496	339.5	12,087	149.2	7,840	98.0	4,416	54.5	2,286	28.2	2,055	25.4	1,714	21.2	995	12.3	1,559	19.2
1965	28,134	343.1	12,419	151.5	7,769	94.8	4,494	54.8	2,271	27.7	2,153	26.3	1,987	24.2	1,068	13.0	1,726	21.1
1966	28,277	340.1	12,506	150.4	7,732	93.0	4,737	57.0	2,407	29.0	2,243	27.0	2,026	24.4	1,152	13.9	1,745	21.0
1967	28,757	333.8	13,030	151.2	7,846	91.1	4,519	52.4	2,265	26.3	2,182	25.3	1,973	22.9	1,240	14.4	1,730	20.1
1968	29,680	342.1	13,292	153.2	7,913	91.2	4,603	53.1	2,466	28.4	2,298	26.5	2,341	27.0	1,259	14.5	1,262	14.5
1969	29,396	336.6	13,328	152.6	7,706	88.2	4,766	54.6	2,579	29.5	2,188	25.1	2,229	25.5	1,430	16.4	1,269	14.8
1970	29,204	329.1	13,551	152.7	7,691	86.7	4,428	49.9	2,309	26.0	2,180	24.6	2,004	22.6	1,558	17.6	1,174	13.2
1971	30,095	335.4	13,594	151.5	7,826	87.2	4,426	49.3	2,274	25.3	2,103	23.4	1,981	22.1	1,657	18.5	1,187	13.2
1972	30,865	342.0	14,045	155.6	7,99[illegible]	88.6	4,566	50.6	2,450	27.1	2,222	24.6	2,009	22.3	1,778	19.7	1,153	12.8
1973	29,944	330.1	14,220	156.7	7,987	88.0	4,630	51.0	2,389	26.3	2,074	22.9	1,958	21.6	1,711	18.9	1,142	12.6
1974	29,220	320.8	14,241	156.3	7,645	83.9	4,211	46.2	1,929	21.2	1,940	21.3	1,637	18.0	1,650	18.1	1,187	13.0
1975	28,298	310.7	14,445	158.6	7,262	79.7	4,002	43.9	1,841	20.2	1,819	20.0	1,690	18.6	1,574	17.3	1,119	12.3
1976	29,233	320.6	14,880	163.2	7,354	80.7	3,912	42.9	1,993	21.9	1,719	18.9	1,812	19.9	1,486	16.3	1,207	13.2
1977	28,895	315.6	15,125	165.2	6,818	74.5	3,945	43.1	1,993	21.8	1,615	17.6	1,639	17.9	1,356	14.8	1,164	12.7
1978	29,406	319.6	15,249	165.7	6,520	70.9	3,970	43.1	2,138	23.2	1,551	16.9	1,828	19.9	1,351	14.7	1,146	12.5
1979	29,296	316.7	15,409	166.6	6,067	65.6	3,839	41.5	1,967	21.3	1,449	15.7	1,454	15.7	1,367	14.8	1,173	12.7
1980	29,790	321.6	15,828	170.0	6,164	66.6	3,627	39.2	1,880	20.3	1,467	15.8	1,712	18.5	1,362	14.7	1,254	13.5
1981	30,172	325.5	16,142	174.1	6,121	66.0	3,390	36.6	1,727	18.6	1,487	16.0	1,644	17.7	1,253	13.5	1,270	13.7
1982	30,099	326.2	16,566	179.5	5,839	63.3	3,113	33.7	1,555	16.9	1,347	14.6	1,665	18.0	1,244	13.5	1,284	13.9
1983	30,412	332.2	16,785	183.3	5,721	62.5	2,947	32.2	1,419	15.5	1,470	16.1	2,007	21.9	1,250	13.7	1,269	13.9
1984	30,100	331.7	16,907	186.3	5,631	62.1	3,049	33.6	1,630	18.0	1,476	16.3	2,018	22.2	1,194	13.2	1,142	12.6
1985	30,618	336.9	17,281	190.1	5,528	60.8	3,228	35.5	1,676	18.4	1,387	15.3	2,193	24.1	1,256	13.8	1,173	12.9
1986	31,270	342.0	17,321	189.4	5,421	59.3	3,202	35.0	1,736	19.0	1,494	16.3	2,513	27.5	1,120	12.2	1,214	13.3

[1]-Cancer includes leukemias, aleukemias, and Hodgkin's disease beginning with 1921.

[2]-Cerebrovascular disease was called Vascular Lesions Affecting-Central Nervous System prior to 1968

[3]-Accidents exclude injuries undetermined whether accidentally or purposely inflicted since 1968.

[4]-Motor vehicle accidents do not include collision with heavier vehicles from 1910 through 1922. Motorcycle accidents are included beginning 1923.

[5]-Chronic liver disease and cirrhosis was called cirrhosis of the liver prior to 1979.

[6]-Atherosclerosis was called General Arteriosclerosis prior to 1968 and was called Arteriosclerosis from 1968-1978.

Table 4.9
Selected Vital Statistics By County, Michigan Residents, 1986

AREA	POPULATION ESTIMATE	LIVE BIRTHS	LOW WEIGHT LIVE BIRTHS	DEATHS	INFANT DEATHS	NEONATAL DEATHS	PERI-NATAL DEATHS	FETAL DEATHS	MARRIAGES[1]	DIVORCES[1]
Michigan	9,144,545	137,626	9,537	80,177	1,565	1,079	1,782	865	77,815	39,553
Alcona	10,129	132	11	144	1	1	1	0	70	46
Alger	8,601	111	6	104	0	0	2	2	69	25
Allegan	86,617	1,374	65	613	12	6	11	7	718	347
Alpena	30,878	411	28	306	3	3	2	0	359	109
Antrim	16,846	214	11	218	3	2	3	2	120	73
Arenac	15,003	194	8	154	1	0	0	0	132	28
Baraga	8,162	104	4	101	2	1	1	0	52	24
Barry	47,800	664	37	382	10	7	12	6	387	203
Bay	114,819	1,604	94	983	15	11	15	5	1,112	466
Benzie	11,262	150	7	131	2	1	2	1	107	46
Berrien	163,602	2,538	201	1,589	26	17	29	15	1,434	756
Branch	39,471	583	27	379	8	7	6	1	385	230
Calhoun	136,887	1,931	125	1,326	19	10	29	21	1,267	805
Cass	48,450	638	59	424	8	5	7	3	388	270
Charlevoix	20,219	322	12	198	1	0	0	0	191	92
Cheboygan	20,733	293	17	224	4	1	5	4	208	96
Chippewa	29,288	340	11	293	2	0	0	0	222	122
Clare	24,967	328	26	277	4	3	6	3	192	107
Clinton	55,744	795	44	366	7	7	13	6	421	191
Crawford	10,114	158	7	116	1	0	1	1	95	68
Delta	38,649	517	23	384	3	2	3	1	311	132
Dickinson	26,748	338	10	339	2	2	2	0	220	113
Eaton	91,241	1,180	55	591	7	7	13	6	704	416
Emmet	24,062	323	9	230	2	2	4	3	433	106
Genesee	434,874	6,691	512	3,498	94	70	86	27	3,955	2,163
Gladwin	21,564	275	13	217	1	1	2	1	169	70
Gogebic	18,770	203	18	295	4	1	1	0	112	177
Gd. Traverse	59,192	977	40	474	10	3	4	1	655	352
Gratiot	39,344	549	41	404	3	2	7	5	352	142
Hillsdale	42,577	638	42	380	5	2	3	1	327	206
Houghton	37,325	482	23	444	3	1	2	1	201	103
Huron	36,562	484	24	419	6	5	8	3	299	99
Ingham	277,806	4,487	276	1,756	45	35	65	31	2,834	1,393
Ionia	53,705	867	59	417	13	6	9	3	435	226
Iosco	30,382	583	31	300	10	6	4	1	303	166
Iron	14,034	135	4	229	0	0	0	0	103	41
Isabella	54,156	646	30	338	1	1	4	3	421	169
Jackson	144,442	2,085	133	1,318	36	17	35	19	1,342	684
Kalamazoo	217,653	3,307	198	1,655	46	29	40	16	2,044	1,057
Kalkaska	11,922	201	14	119	3	1	1	0	117	70
Kent	477,507	8,551	492	3,642	84	44	74	39	4,909	2,188
Keweenaw	2,039	13	0	31	0	0	0	0	109	6
Lake	8,612	114	9	122	3	2	2	0	44	19

Table 4.9
Selected Vital Statistics By County, Michigan Residents, 1986 (continued)

AREA	POPULATION ESTIMATE	LIVE BIRTHS	LOW WEIGHT LIVE BIRTHS	DEATHS	INFANT DEATHS	NEONATAL DEATHS	PERI-NATAL DEATHS	FETAL DEATHS	MARRIAGES[1]	DIVORCES[1]
Lapeer	70,353	974	39	511	7	6	8	4	601	356
Leelanau	14,957	251	7	132	3	2	3	1	100	62
Lenawee	88,758	1,240	59	753	8	6	8	3	680	390
Livingston	104,620	1,469	63	641	12	8	18	11	919	507
Luce	5,880	86	5	63	1	1	1	0	54	33
Mackinac	10,453	138	6	150	0	0	2	2	130	37
Macomb	697,181	9,410	595	5,687	78	57	98	53	5,568	3,067
Manistee	22,206	262	16	291	3	2	5	4	176	84
Marquette	71,342	1,119	56	538	7	4	11	7	625	380
Mason	26,360	361	20	272	2	2	5	3	250	127
Mecosta	38,189	446	16	247	4	2	11	9	254	150
Menominee	25,847	364	30	273	8	7	7	1	235	42
Midland	72,400	1,040	38	470	7	3	8	6	682	333
Missaukee	10,960	175	12	111	3	1	3	2	84	48
Monroe	131,973	1,927	111	975	25	19	20	4	1,050	583
Montcalm	50,822	769	47	488	5	4	7	3	456	208
Montmorency	7,929	68	4	115	1	1	3	2	51	18
Muskegon	158,545	2,484	173	1,381	25	14	27	14	1,401	920
Newaygo	37,663	590	38	345	7	4	5	2	367	167
Oakland	1,025,785	14,819	877	7,985	140	102	166	79	9,708	5,161
Oceana	22,656	358	20	206	4	3	5	2	203	115
Ogemaw	17,409	228	10	202	0	0	1	1	174	106
Ontonagon	8,909	97	10	103	1	1	1	0	66	38
Osceola	20,418	303	26	221	6	5	4	1	190	32
Oscoda	6,928	100	1	98	0	0	0	0	59	16
Otsego	15,803	262	14	122	2	2	4	2	267	64
Ottawa	171,274	2,915	135	1,094	19	13	27	16	1,324	614
Presque Isle	13,922	163	10	149	1	1	2	1	108	41
Roscommon	18,738	196	16	266	1	1	2	1	130	59
Saginaw	216,392	3,364	257	1,831	37	27	47	22	1,796	629
St. Clair	140,507	2,088	102	1,287	19	15	15	6	1,223	681
St. Joseph	59,587	888	59	523	10	8	13	6	567	317
Sanilac	40,319	579	24	473	5	4	5	1	328	143
Schoolcraft	8,330	95	5	116	1	1	1	1	68	26
Shiawasee	68,962	1,009	56	569	9	2	7	5	603	276
Tuscola	55,083	763	41	416	5	3	4	1	434	217
Van Buren	67,346	996	66	644	16	8	9	5	561	301
Washtenaw	265,959	3,913	220	1,552	38	30	46	19	2,524	1,142
Wayne	2,164,319	34,408	3,378	22,639	530	385	627	298	15,213	7,712
Wexford	26,706	376	18	277	3	2	2	1	258	149
Co. Not Stated	0	3	1	31	2	2	30	28	0	0

[1] By county of occurrence rather than county of residence

Table 4.10
Selected Vital Statistics Rates By County, Michigan Residents, 1986

AREA	LIVE BIRTHS	LOW WEIGHT LIVE BIRTHS[1]	DEATHS	INFANT DEATHS	NEONATAL DEATHS	PERI-NATAL DEATHS	FETAL DEATHS	MARRIAGES[2]	DIVORCES[2]
Michigan	15.1	69.3	8.8	11.4	7.8	12.9	6.2	17.0	8.7
Alcona	13.0	83.3	14.2	7.6	7.6	7.6	0.0	13.8	9.1
Alger	12.9	54.1	12.1	0.0	0.0	17.7	17.7	16.0	5.8
Allegan	15.9	47.3	7.1	8.7	4.4	8.0	5.1	16.6	8.0
Alpena	13.3	68.1	9.9	7.3	7.3	4.9	0.0	23.3	7.1
Antrim	12.7	51.4	12.9	14.0	9.3	13.9	9.3	14.2	8.7
Arenac	12.9	41.2	10.3	5.2	0.0	0.0	0.0	17.6	3.7
Baraga	12.7	38.5	12.4	19.2	9.6	9.6	0.0	12.7	5.9
Barry	13.9	55.7	8.0	15.1	10.5	17.9	9.0	16.2	8.5
Bay	14.0	58.6	8.6	9.4	6.9	9.3	3.1	19.4	8.1
Benzie	13.3	46.7	11.6	13.3	6.7	13.2	6.6	19.0	8.2
Berrien	15.5	79.2	9.7	10.2	6.7	11.4	5.9	17.5	9.2
Branch	14.8	46.3	9.6	13.7	12.0	10.3	1.7	19.5	11.7
Calhoun	14.1	64.7	9.7	9.8	5.2	14.9	10.8	18.5	11.8
Cass	13.2	92.5	8.8	12.5	7.8	10.9	4.7	16.0	11.1
Charlevoix	15.9	37.3	9.8	3.1	0.0	0.0	0.0	18.9	9.1
Cheboygan	14.1	58.0	10.8	13.7	3.4	16.8	13.5	20.1	9.3
Chippewa	11.6	32.4	10.0	5.9	0.0	0.0	0.0	15.2	8.3
Clare	13.1	79.3	11.1	12.2	9.1	18.1	9.1	15.4	8.6
Clinton	14.3	55.3	6.6	8.8	8.8	16.2	7.5	15.1	6.9
Crawford	15.6	44.3	11.5	6.3	0.0	6.3	6.3	18.8	13.4
Delta	13.4	44.5	9.9	5.8	3.9	5.8	1.9	16.1	6.8
Dickinson	12.6	29.6	12.7	5.9	5.9	5.9	0.0	16.4	8.4
Eaton	12.9	46.6	6.5	5.9	5.9	11.0	5.1	15.4	9.1
Emmet	13.4	27.9	9.6	6.2	6.2	12.3	9.2	36.0	8.8
Genesee	15.4	76.5	8.0	14.0	10.5	12.8	4.0	18.2	9.9
Gladwin	12.8	47.3	10.1	3.6	3.6	7.2	3.6	15.7	6.5
Gogebic	10.8	88.7	15.7	19.7	4.9	4.9	0.0	11.9	18.9
Gd. Traverse	16.5	40.9	8.0	10.2	3.1	4.1	1.0	22.1	11.9
Gratiot	14.0	74.7	10.3	5.5	3.6	12.6	9.0	17.9	7.2
Hillsdale	15.0	65.8	8.9	7.8	3.1	4.7	1.6	15.4	9.7
Houghton	12.9	47.7	11.9	6.2	2.1	4.1	2.1	10.8	5.5
Huron	13.2	49.6	11.5	12.4	10.3	16.4	6.2	16.4	5.4
Ingham	16.2	61.5	6.3	10.0	7.8	14.4	6.9	20.4	10.0
Ionia	16.1	68.1	7.8	15.0	6.9	10.3	3.4	16.2	8.4
Iosco	19.2	53.2	9.9	17.2	10.3	6.8	1.7	19.9	10.9
Iron	9.6	29.6	16.3	0.0	0.0	0.0	0.0	14.7	5.8
Isabella	11.9	46.4	6.2	1.5	1.5	6.2	4.6	15.5	6.2
Jackson	14.4	63.8	9.1	17.3	8.2	16.6	9.0	18.6	9.5
Kalamazoo	15.2	59.9	7.6	13.9	8.8	12.0	4.8	18.8	9.7
Kalkaska	16.9	69.7	10.0	14.9	5.0	5.0	0.0	19.6	11.7
Kent	17.9	57.5	7.6	9.8	5.1	8.6	4.5	20.6	9.2
Keweenaw	6.4	0.0	15.2	0.0	0.0	0.0	0.0	106.9	5.9
Lake	13.2	78.9	14.2	26.3	17.5	17.5	0.0	10.2	4.4

Table 4.10
Selected Vital Statistics Rates By County, Michigan Residents, 1986 (continued)

AREA	LIVE BIRTHS	LOW WEIGHT LIVE BIRTHS[1]	DEATHS	INFANT DEATHS	NEONATAL DEATHS	PERI-NATAL DEATHS	FETAL DEATHS	MARRIAGES[2]	DIVORCES[2]
Lapeer	13.8	40.0	7.3	7.2	6.2	8.2	4.1	17.1	10.1
Leelanau	16.8	27.9	8.8	12.0	8.0	11.9	4.0	13.4	8.3
Lenawee	14.0	47.6	8.5	6.5	4.8	6.4	2.4	15.3	8.8
Livingston	14.0	42.9	6.1	8.2	5.4	12.2	7.4	17.6	9.7
Luce	14.6	58.1	10.7	11.6	11.6	11.6	0.0	18.4	11.2
Mackinac	13.2	43.5	14.3	0.0	0.0	14.3	14.3	24.9	7.1
Macomb	13.5	63.2	8.2	8.3	6.1	10.4	5.6	16.0	8.8
Manistee	11.8	61.1	13.1	11.5	7.6	18.8	15.0	15.9	7.6
Marquette	15.7	50.0	7.5	6.3	3.6	9.8	6.2	17.5	10.7
Mason	13.7	55.4	10.3	5.5	5.5	13.7	8.2	19.0	9.6
Mecosta	11.7	35.9	6.5	9.0	4.5	24.2	19.8	13.3	7.9
Menominee	14.1	82.4	10.6	22.0	19.2	19.2	2.7	18.2	3.2
Midland	14.4	36.5	6.5	6.7	2.9	7.6	5.7	18.8	9.2
Missaukee	16.0	68.6	10.1	17.1	5.7	16.9	11.3	15.3	8.8
Monroe	14.6	57.6	7.4	13.0	9.9	10.4	2.1	15.9	8.8
Montcalm	15.1	61.1	9.6	6.5	5.2	9.1	3.9	17.9	8.2
Montmorency	8.6	58.8	14.5	14.7	14.7	42.9	28.6	12.9	4.5
Muskegon	15.7	69.6	8.7	10.1	5.6	10.8	5.6	17.7	11.6
Newaygo	15.7	64.4	9.2	11.9	6.8	8.4	3.4	19.5	8.9
Oakland	14.4	59.2	7.8	9.4	6.9	11.1	5.3	18.9	10.1
Oceana	15.8	55.9	9.1	11.2	8.4	13.9	5.6	17.9	10.2
Ogemaw	13.1	43.9	11.6	0.0	0.0	4.4	4.4	20.0	12.2
Ontonagon	10.9	103.1	11.6	10.3	10.3	10.3	0.0	14.8	8.5
Osceola	14.8	85.8	10.8	19.8	16.5	13.2	3.3	18.6	3.1
Oscoda	14.4	10.0	14.1	0.0	0.0	0.0	0.0	17.0	4.6
Otsego	16.6	53.4	7.7	7.6	7.6	15.2	7.6	33.8	8.1
Ottawa	17.0	46.3	6.4	6.5	4.5	9.2	5.5	15.5	7.2
Presque Isle	11.7	61.3	10.7	6.1	6.1	12.2	6.1	15.5	5.9
Roscommon	10.5	81.6	14.2	5.1	5.1	10.2	5.1	13.9	6.3
Saginaw	15.5	76.4	8.5	11.0	8.0	13.9	6.5	16.6	5.8
St. Clair	14.9	48.9	9.2	9.1	7.2	7.2	2.9	17.4	9.7
St. Joseph	14.9	66.4	8.8	11.3	9.0	14.5	6.7	19.0	10.6
Sanilac	14.4	41.5	11.7	8.6	6.9	8.6	1.7	16.3	7.1
Schoolcraft	11.4	52.6	13.9	10.5	10.5	10.4	10.4	16.3	6.2
Shiawasee	14.6	55.5	8.3	8.9	2.0	6.9	4.9	17.5	8.0
Tuscola	13.9	53.7	7.6	6.6	3.9	5.2	1.3	15.8	7.9
Van Buren	14.8	66.3	9.6	16.1	8.0	9.0	5.0	16.7	8.9
Washtenaw	14.7	56.2	5.8	9.7	7.7	11.7	4.8	19.0	8.6
Wayne	15.9	98.2	10.5	15.4	11.2	18.1	8.6	14.1	7.1
Wexford	14.1	47.9	10.4	8.0	5.3	5.3	2.7	19.3	11.2

[1] Ratio per 1,000 live births.

[2] By county of occurrence rather than county of residence. Rate of persons per 1,000 population rather than events per population.

Table 4.11
Live Births with Selected Risk Factors by County of Residence, Michigan Residents, 1986

STATE AND COUNTIES	COMPLICATIONS REPORTED		CONGENITAL ANOMALIES REPORTED		4TH BIRTH OR HIGHER		MOTHER'S EDUCATION 11TH GRADE OR LESS		INADEQUATE PRENATAL CARE[1]		MOTHERS UNDER 18 YEARS OF AGE	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Michigan	40,837	29.7	875	0.6	13,184	9.6	26,451	19.2	8,138	5.9	6,303	4.6
Alcona	69	52.3	2	1.5	18	13.6	23	17.4	1	0.8	3	2.3
Alger	39	35.1	-	-	8	7.2	22	19.8	10	9.0	13	11.7
Allegan	374	27.2	11	0.8	115	8.3	283	20.6	99	7.2	65	4.7
Alpena	235	57.2	8	1.9	29	7.0	86	20.9	11	2.7	14	3.4
Antrim	49	22.9	4	1.9	25	11.6	39	18.2	17	7.9	9	4.2
Arenac	56	28.9	4	2.1	22	11.4	29	14.9	11	5.7	3	1.5
Baraga	41	39.4	-	-	17	16.3	16	15.4	14	13.5	3	2.9
Barry	374	56.3	12	1.8	60	9.0	116	17.5	17	2.6	22	3.3
Bay	397	24.8	5	0.3	163	10.1	298	18.6	57	3.6	66	4.1
Benzie	27	18.0	1	0.7	12	8.0	30	20.0	21	14.0	4	2.7
Berrien	815	32.1	17	0.7	258	10.1	673	26.5	243	9.6	197	7.8
Branch	122	20.9	3	0.5	66	11.3	160	27.4	60	10.3	24	4.1
Calhoun	706	36.6	12	0.6	175	9.1	395	20.5	131	6.8	103	5.3
Cass	245	38.4	5	0.8	53	8.3	174	27.3	51	8.0	29	4.5
Charlevoix	120	37.3	2	0.6	27	8.4	54	16.8	14	4.3	15	4.7
Cheboygan	123	42.0	7	2.4	30	10.2	39	13.3	16	5.5	6	2.0
Chippewa	78	22.9	2	0.6	36	10.6	75	22.1	31	9.1	16	4.7
Clare	107	32.6	2	0.6	37	11.3	71	21.6	26	7.9	14	4.3
Clinton	218	27.4	8	1.0	84	10.5	83	10.4	38	4.8	22	2.8
Crawford	76	48.1	2	1.3	23	14.6	42	26.6	8	5.1	12	7.6
Delta	146	28.2	4	0.8	39	7.5	79	15.3	21	4.1	13	2.5
Dickinson	55	16.3	1	0.3	26	7.7	34	10.1	7	2.1	11	3.3
Eaton	397	33.6	10	0.8	97	8.2	137	11.6	54	4.6	39	3.3
Emmet	105	32.5	2	0.6	33	10.2	37	11.5	19	5.9	7	2.2
Genesee	2,575	38.5	13	0.2	626	9.4	1,514	22.6	221	3.3	433	6.5
Gladwin	99	36.0	2	0.7	38	13.8	86	31.3	31	11.3	14	5.1
Gogebic	87	42.9	1	0.5	21	10.3	29	14.3	17	8.4	10	4.9
Grand Traverse	217	22.2	6	0.6	84	8.6	111	11.4	94	9.6	23	2.4
Gratiot	160	29.1	3	0.5	44	8.0	78	14.2	30	5.5	14	2.6
Hillsdale	239	37.5	7	1.1	83	13.0	150	23.5	45	7.1	39	6.1
Houghton	183	38.0	8	1.7	90	18.7	44	9.1	15	3.1	9	1.9
Huron	137	28.3	4	0.8	49	10.1	66	13.6	22	4.5	17	3.5
Ingham	1,029	22.9	17	0.4	374	8.3	741	16.5	264	5.9	207	4.6
Ionia	262	30.2	13	1.5	86	9.9	169	19.5	37	4.3	39	4.5
Iosco	252	43.2	3	0.5	38	6.5	83	14.2	7	1.2	11	1.9
Iron	53	39.3	2	1.5	12	8.9	16	11.9	6	4.4	8	5.9
Isabella	230	35.6	6	0.9	43	6.7	95	14.7	45	7.0	21	3.3
Jackson	577	27.7	13	0.6	173	8.3	433	20.8	161	7.7	130	6.2
Kalamazoo	1,087	32.9	13	0.4	272	8.3	503	15.2	144	4.4	134	4.1
Kalkaska	42	20.9	1	0.5	19	9.5	53	26.4	19	9.5	9	4.5
Kent	2,052	24.0	60	0.7	821	9.6	1,419	16.6	348	4.1	364	4.3

Table 4.11, 1986 (Continued)

STATE AND COUNTIES	COMPLICATIONS REPORTED		CONGENITAL ANOMALIES REPORTED		4TH BIRTH OR HIGHER		MOTHER'S EDUCATION 11TH GRADE OR LESS		INADEQUATE PRENATAL CARE[1]		MOTHERS UNDER 18 YEARS OF AGE	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Keweenaw	3	23.1	1	7.7	2	15.4	1	7.7	1	7.7	-	-
Lake	44	38.6	4	3.5	14	12.3	27	23.7	10	8.8	6	5.3
Lapeer	351	36.0	9	0.9	94	9.6	189	19.4	22	2.3	37	3.8
Leelanau	59	23.5	3	1.2	26	10.4	31	12.4	28	11.2	5	2.0
Lenawee	355	28.6	6	0.5	133	10.8	280	22.6	42	3.4	54	4.4
Livingston	430	29.3	9	0.6	128	8.7	158	10.8	60	4.1	32	2.2
Luce	19	22.1	-	-	14	16.3	25	29.1	5	5.8	7	8.1
Mackinac	37	26.8	-	-	17	12.3	20	14.5	9	6.5	7	5.1
Macomb	2,715	28.9	42	0.4	658	7.0	1,175	12.5	285	3.0	193	2.1
Manistee	63	24.0	1	0.4	23	8.8	41	15.6	16	6.1	7	2.7
Marquette	490	43.8	7	0.6	97	8.7	98	8.8	62	5.5	18	1.6
Mason	96	26.6	5	1.4	38	10.5	79	21.9	19	5.3	18	5.0
Mecosta	130	29.1	16	3.6	44	9.9	84	18.8	37	8.3	19	4.3
Menominee	178	48.9	6	1.6	37	10.2	47	12.9	29	8.0	10	2.7
Midland	524	50.4	5	0.5	74	7.1	162	15.6	35	3.4	39	3.8
Missaukee	47	26.9	1	0.6	26	14.9	35	20.0	2	1.1	4	2.3
Monroe	729	37.8	13	0.7	189	9.8	365	18.9	88	4.6	80	4.2
Montcalm	254	33.0	9	1.2	73	9.5	177	23.0	68	8.8	41	5.3
Montmorency	35	51.5	-	-	6	8.9	10	14.7	2	2.9	2	2.9
Muskegon	632	25.4	12	0.5	243	9.8	523	21.1	1,226	49.4	150	6.0
Newaygo	200	33.9	9	1.5	68	11.5	132	22.4	45	7.6	27	4.6
Oakland	4,064	27.4	63	0.4	1,075	7.3	1,787	12.1	462	3.1	349	2.4
Oceana	98	27.4	3	0.8	49	13.6	112	31.3	51	14.2	19	5.3
Ogemaw	51	22.4	3	1.3	17	7.5	51	22.4	10	4.4	10	4.4
Ontonagon	35	36.1	3	3.1	6	6.2	11	11.3	6	6.2	2	2.1
Osceola	107	35.3	6	2.0	41	13.5	54	17.8	24	7.9	14	4.6
Oscoda	24	24.0	3	3.0	21	21.0	36	36.0	8	8.0	5	5.0
Otsego	56	21.4	2	0.8	32	12.2	35	13.4	16	6.1	10	3.8
Ottawa	637	21.9	18	0.6	261	9.0	353	12.1	206	7.1	86	3.0
Presque Isle	63	38.7	3	1.8	12	7.4	25	15.3	9	5.5	7	4.3
Roscommon	74	37.8	1	0.5	23	11.8	50	25.5	5	2.6	4	2.0
Saginaw	763	22.7	5	0.1	358	10.6	732	21.8	173	5.1	235	7.0
St. Clair	730	35.0	19	0.9	168	8.1	438	21.0	83	4.0	76	3.6
St. Joseph	281	31.6	6	0.7	102	11.5	224	25.2	48	5.4	40	4.5
Sanilac	209	36.1	7	1.2	71	12.3	112	19.3	37	6.4	22	3.8
Schoolcraft	17	17.9	1	1.1	9	9.5	19	20.0	2	2.1	5	5.3
Shiawassee	275	27.3	5	0.5	94	9.3	177	17.5	48	4.8	37	3.7
Tuscola	227	29.8	7	0.9	78	10.3	140	18.3	42	5.5	25	3.3
Van Buren	316	31.7	7	0.7	113	11.3	276	27.7	89	8.9	59	5.9
Washtenaw	1,063	27.2	12	0.3	314	8.0	415	10.6	121	3.1	95	2.4
Wayne	9,973	29.0	243	0.7	3,974	11.6	9,062	26.3	2,107	6.1	2,239	6.5
Wexford	127	33.8	4	1.1	34	9.1	96	25.5	16	4.3	16	4.3
Co. Not Stated	1	33.3	-	-	2	66.7	2	66.7	1	33.3	-	-

[1] The Kessner Index is a classification of prenatal care based on the month of pregnancy prenatal care began, the number of prenatal visits and the length of pregnancy.

Table 4.12
Live Births by Age of Mother and County of Residence, Michigan Residents, 1986

AREA	TOTAL	AGE OF MOTHER												
		UNDER 15	15	16	17	18	19	15-19	20-24	25-29	30-34	35-39	40 AND OVER	AGE NOT STATED
Michigan	137,626	335	895	1,886	3,187	4,594	5,974	16,536	39,611	46,421	26,331	7,503	877	12
Alcona	132	-	1	-	2	3	9	15	52	37	22	4	2	-
Alger	111	-	2	9	2	4	4	21	34	30	18	7	1	-
Allegan	1,374	3	9	17	36	46	54	162	445	451	252	56	5	-
Alpena	411	-	1	7	6	19	12	45	129	163	63	10	1	-
Antrim	214	-	2	2	5	10	11	30	75	72	18	14	5	-
Arenac	194	-	1	1	1	12	7	22	60	70	36	5	1	-
Baraga	104	-	-	2	1	4	4	11	38	26	24	4	1	-
Barry	664	-	3	4	15	20	26	68	228	217	114	35	2	-
Bay	1,604	2	6	23	35	45	69	178	459	577	307	76	5	-
Benzie	150	1	-	-	3	9	6	18	54	46	25	5	1	-
Berrien	2,538	8	21	62	106	117	138	444	816	777	357	124	12	-
Branch	583	2	1	9	12	24	28	74	218	182	78	25	4	-
Calhoun	1,931	7	12	37	47	84	97	277	642	607	300	82	16	-
Cass	638	1	2	8	18	30	42	100	233	184	95	24	1	-
Charlevoix	322	1	1	4	9	7	14	35	112	98	49	23	4	-
Cheboygan	293	1	1	1	3	11	17	33	92	90	62	12	3	-
Chippewa	340	-	1	4	11	15	19	50	142	83	50	13	2	-
Clare	328	-	4	3	7	17	22	53	126	92	50	7	-	-
Clinton	795	1	2	9	10	18	32	71	238	300	141	40	4	-
Crawford	158	-	1	.5	6	9	8	29	46	43	26	13	1	-
Delta	517	-	-	6	7	23	31	67	171	169	80	24	6	-
Dickinson	338	-	2	3	6	8	19	38	95	135	52	17	1	-
Eaton	1,180	3	3	13	20	39	48	123	339	390	242	75	8	-
Emmet	323	-	-	3	4	13	12	32	80	110	78	22	1	-
Genesee	6,691	24	69	122	218	281	341	1,031	2,089	2,140	1,100	263	43	1
Gladwin	275	1	2	4	7	16	17	46	88	91	34	14	1	-
Gogebic	203	-	-	5	5	8	11	29	65	62	32	12	3	-
Grand Traverse	977	-	4	6	13	27	31	81	242	358	211	80	5	-
Gratiot	549	1	2	6	5	13	34	60	198	199	68	21	2	-
Hillsdale	638	1	7	13	19	20	27	85	243	192	89	23	5	-
Houghton	482	-	1	2	6	13	22	44	137	163	101	29	8	-
Huron	484	-	1	7	9	10	17	44	160	177	84	14	5	-
Ingham	4,487	13	24	65	105	137	184	515	1,259	1,491	886	292	31	-
Ionia	867	1	7	14	17	37	41	116	318	267	124	37	4	-
Iosco	583	-	3	2	6	20	42	73	241	175	69	24	1	-
Iron	135	-	1	2	5	6	7	21	41	41	22	9	1	-
Isabella	646	-	3	6	12	22	35	78	204	233	106	22	3	-
Jackson	2,085	2	15	39	74	98	87	313	678	648	331	102	11	-
Kalamazoo	3,307	7	21	41	65	95	117	339	886	1,164	709	185	17	-
Kalkaska	201	0	2	2	5	11	14	34	78	61	26	2	-	-
Kent	8,551	19	64	96	185	241	350	936	2,420	3,014	1,698	422	42	-

Table 4.12
Live Births by Age of Mother and County of Residence, Michigan Residents, 1986 (Cont.)

AREA	TOTAL	AGE OF MOTHER											
		UNDER 15	15	16	17	18	19	15-19	20-24	25-29	30-34	35-39	40 AND OVER	AGE NOT STATED
Keweenaw	13	-	-	-	-	-	-	-	5	4	4	-	-	-
Lake	114	-	1	-	5	3	5	14	50	33	13	3	1	-
Lapeer	974	-	2	12	23	35	47	119	337	310	152	49	7	-
Leelanau	251	-	1	1	3	6	14	25	59	68	76	21	1	1
Lenawee	1,240	1	11	13	29	47	62	162	426	381	203	60	7	-
Livingston	1,469	1	2	7	22	23	45	99	398	489	373	98	11	-
Luce	86	-	1	3	3	4	3	14	29	24	11	8	-	-
Mackinac	138	-	2	2	3	8	3	18	47	38	28	7	-	-
Macomb	9,410	4	14	62	113	167	262	618	2,316	3,807	2,107	497	59	2
Manistee	262	-	2	1	4	1	15	23	87	95	48	7	2	-
Marquette	1,119	-	4	5	9	34	42	94	390	370	206	55	4	-
Mason	361	1	1	4	12	15	21	53	120	113	51	21	2	-
Mecosta	446	-	-	3	16	19	21	59	158	134	73	22	-	-
Menominee	364	-	1	2	7	12	22	44	121	125	58	14	2	-
Midland	1,040	-	10	10	19	31	39	109	299	349	219	60	4	-
Missaukee	175	-	1	1	2	5	7	16	76	43	33	7	-	-
Monroe	1,927	2	4	28	46	77	87	242	646	625	323	77	12	-
Montcalm	769	2	2	12	25	38	41	118	314	204	96	32	3	-
Montmorency	68	-	1	1	-	1	2	5	18	31	11	2	1	-
Muskegon	2,484	9	18	37	86	98	138	377	795	818	377	91	16	1
Newaygo	590	2	1	5	19	22	39	86	217	178	83	20	4	-
Oakland	14,819	18	35	98	198	283	411	1,025	3,236	5,521	3,781	1,133	105	-
Oceana	358	-	2	7	10	16	15	50	136	110	40	21	1	-
Ogemaw	228	-	-	5	5	12	12	34	89	74	25	6	-	-
Ontonagon	97	-	-	-	2	2	5	9	38	30	14	6	-	-
Osceola	303	-	2	6	6	8	13	35	112	83	50	18	5	-
Oscoda	100	-	1	2	2	3	2	10	38	29	15	8	-	-
Otsego	262	-	1	4	5	9	9	28	84	102	37	9	2	-
Ottawa	2,915	2	9	25	50	58	81	223	778	1,152	608	137	14	1
Presque Isle	163	-	-	1	6	3	9	19	64	42	29	6	1	2
Roscommon	196	-	-	4	-	5	15	24	54	61	48	6	3	-
Saginaw	3,364	13	40	66	116	152	159	533	988	1,093	542	175	20	-
St. Clair	2,088	2	9	23	42	66	106	246	715	686	354	78	7	-
St. Joseph	888	2	8	10	20	30	42	110	295	271	155	53	2	-
Sanilac	579	1	2	7	12	17	41	79	190	180	92	32	5	-
Schoolcraft	95	-	-	1	4	4	6	15	32	29	16	3	-	-
Shiawassee	1,009	1	2	14	20	31	41	108	332	348	178	39	3	-
Tuscola	763	-	2	4	19	22	35	82	237	291	121	30	2	-
Van Buren	996	6	4	17	32	39	59	151	323	302	152	56	6	-
Washtenaw	3,913	3	9	30	53	76	113	281	845	1,327	1,028	390	39	-
Wayne	34,408	165	387	686	1,001	1,454	1,747	5,275	9,706	10,921	6,216	1,866	255	4
Wexford	376	1	1	3	11	16	32	63	139	105	55	11	2	-
Co. Not Stated	3	-	-	-	-	-	-	-	1	-	1	1	-	-

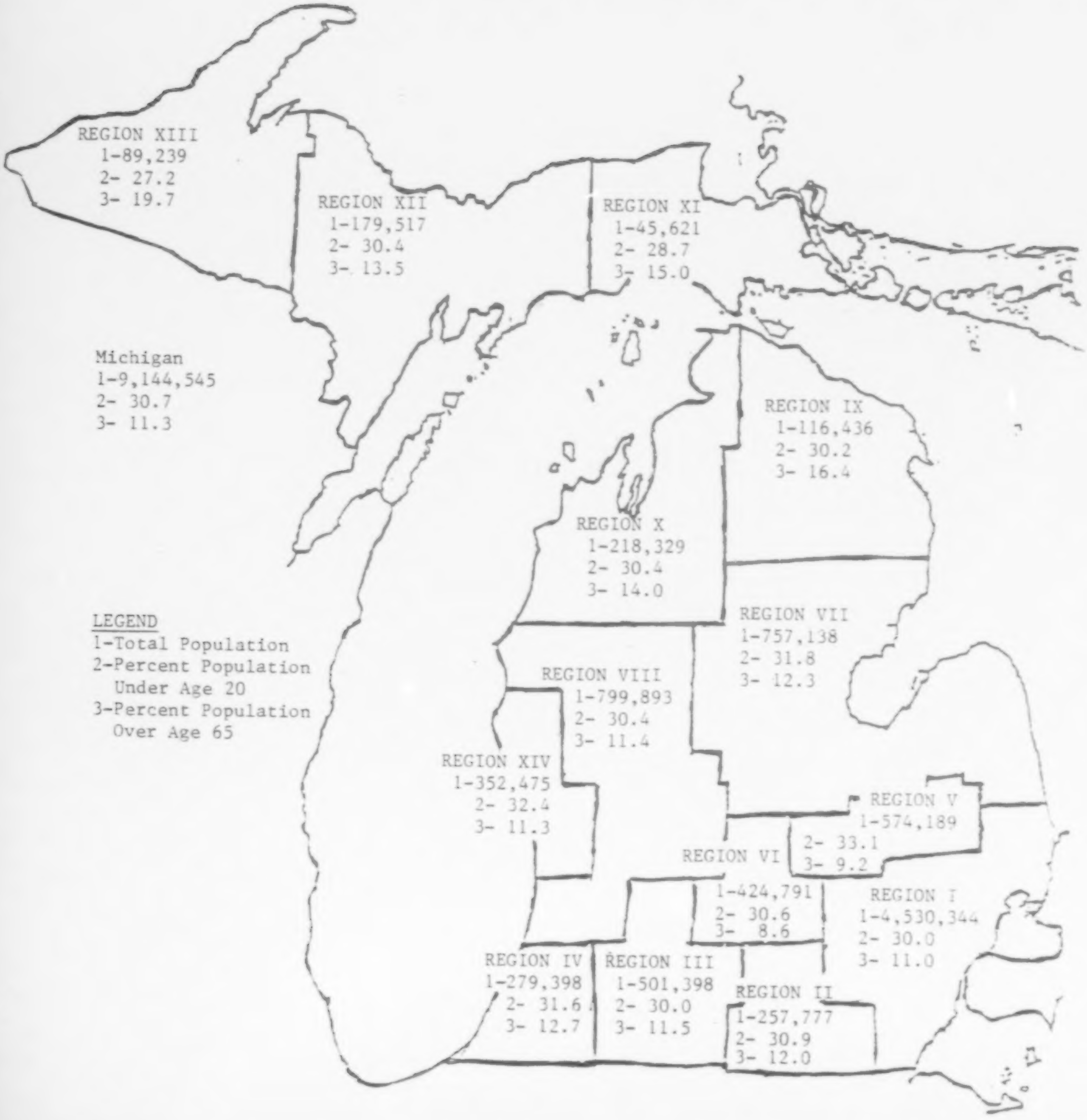


FIGURE 4.2 Total Population, Percent Under Age 20 and Percent Age 65 and Over by Region, Michigan, 1986

REGION XIII
1-89,239
2- 27.2
3- 19.7
REGION XII
1-179,517
2- 30.4
3- 13.5
REGION XI
1-45,621
2- 28.7
3- 15.0
Michigan
1-9,144,545
2- 30.7
3- 11.3
REGION IX
1-116,436
2- 30.2
3- 16.4
REGION X
1-218,329
2- 30.4
3- 14.0
LEGEND
1-Total Population
2-Percent Population Under Age 20
3-Percent Population Over Age 65
REGION VII
1-757,138
2- 31.8
3- 12.3
REGION VIII
1-799,893
2- 30.4
3- 11.4
REGION XIV
1-352,475
2- 32.4
3- 11.3
REGION V
1-574,189
2- 33.1
3- 9.2
REGION VI
1-424,791
2- 30.6
3- 8.6
REGION I
1-4,530,344
2- 30.0
3- 11.0
REGION IV
1-279,398
2- 31.6
3- 12.7
REGION III
1-501,398
2- 30.0
3- 11.5
REGION II
1-257,777
2- 30.9
3- 12.0

Table 4.13
Vital Statistics for Residents of Selected Michigan Cities[1], 1986

AREA	LIVE BIRTHS	DEATHS	INFANT DEATHS		FETAL DEATHS	
			NUMBER	RATE	NUMBER	RATE
Allen Park	395	343	2	5.1	3	7.5
Ann Arbor	1,426	533	17	11.9	9	6.3
Battle Creek[2]	996	603	11	11.0	14	14.0
Bay City	689	450	6	8.7	3	4.3
Burton City	382	244	1	2.6	1	2.6
Dearborn	1,314	999	11	8.4	7	5.3
Dearborn Heights	692	615	6	8.7	5	7.2
Detroit	18,998	12,848	390	20.5	209	10.9
East Detroit	475	434	3	6.3	2	4.2
East Lansing	443	141	3	6.8	2	4.5
Farmington Hills	835	448	4	4.8	1	1.2
Ferndale	446	306	2	4.5	-	-
Flint	3,135	1,620	61	19.5	11	3.5
Garden City	441	249	3	6.8	1	2.3
Grand Rapids	4,019	1,993	52	12.9	22	5.4
Highland Park	424	320	8	18.9	4	9.3
Holland	522	265	6	11.5	7	13.2
Inkster	538	326	6	11.2	6	11.0
Jackson	745	460	14	18.8	9	11.9
Kalamazoo	1,491	699	21	14.1	7	4.7
Kentwood	460	126	4	8.7	2	4.3
Lansing	2,669	965	23	8.6	21	7.8
Lincoln Park	651	482	4	6.1	7	10.6
Livonia	1,204	837	11	9.1	3	2.5
Madison Heights	502	270	5	10.0	2	4.0
Midland	525	271	4	7.6	3	5.7
Muskegon	858	474	11	12.8	9	10.4
Oak Park	526	259	6	11.4	6	11.3
Pontiac	1,684	741	27	16.0	15	8.8
Portage	496	220	10	20.2	2	4.0
Port Huron	640	408	9	14.1	2	3.1
Roseville	757	498	7	9.2	4	5.3
Royal Oak	1,075	637	11	10.2	6	5.6
Saginaw	1,596	822	22	13.8	10	6.2
St. Clair Shores	853	806	5	5.9	2	2.3
Southfield	822	813	5	6.1	3	3.6
Southgate	355	238	-	-	2	5.6
Sterling Heights	1,385	609	7	5.1	4	2.9
Taylor	1,202	519	12	10.0	4	3.3
Troy	838	392	13	15.5	4	4.8
Warren	1,868	1,478	14	7.5	16	8.5
Westland	1,209	674	9	7.4	9	7.4
Wyandotte	552	366	8	14.5	3	5.4
Wyoming	1,026	329	13	12.7	4	3.9

[1] 25,000 population or over according to the 1980 census.

[2] On January 1, 1983, Battle Creek City annexed Battle Creek Township. The data shown for Battle Creek in this table are for the current boundaries of Battle Creek, and thus are not comparable to data for Battle Creek for earlier years. The infant death rate in 1982 for the area which is now Battle Creek was 15.9.

Table 4.14
Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986

AREA	All Causes	Tuberculosis All Forms	All Other Infectious and Parasitic Diseases	MALIGNANT NEOPLASMS							
				Total	Digestive Organs and Peritoneum	Respiratory and Intrathoracic Organs	Breast	Genital Organs	Urinary Organs	Leukemia	Other
Michigan	80,177	44	925	17,321	4,189	4,757	1,558	1,915	766	670	3,466
Alcona	144	-	-	43	8	13	1	6	1	3	11
Alger	104	-	1	17	7	1	1	2	1	-	5
Allegan	613	-	7	136	29	35	8	15	11	5	33
Alpena	306	-	4	66	22	19	4	4	2	1	14
Antrim	218	-	3	47	12	13	2	5	3	1	11
Arenac	154	-	2	31	4	15	3	1	2	-	6
Baraga	101	-	1	18	2	12	1	2	-	-	1
Barry	382	-	5	84	21	23	7	9	4	3	17
Bay	983	-	5	212	51	55	15	25	13	5	48
Benzie	131	-	1	32	6	11	2	6	-	1	6
Berrien	1,589	2	18	358	94	99	23	41	18	9	74
Branch	379	1	1	66	12	19	5	9	2	5	14
Calhoun	1,326	1	13	293	90	75	22	37	11	11	47
Cass	424	1	4	92	31	27	4	9	1	5	15
Charlevoix	198	-	2	51	10	17	5	2	4	3	10
Cheboygan	224	-	2	55	8	23	3	5	5	-	11
Chippewa	293	-	-	68	16	18	7	7	6	3	11
Clare	277	-	5	64	16	26	5	3	1	2	11
Clinton	366	-	6	81	17	20	5	13	3	2	21
Crawford	116	-	2	26	8	7	1	1	4	-	5
Delta	384	-	1	83	22	19	9	5	8	4	16
Dickinson	339	-	2	61	17	14	1	11	2	1	15
Eaton	591	1	10	121	26	36	8	13	3	5	30
Emmet	230	-	-	53	14	14	5	4	1	1	14
Genesee	3,498	1	29	754	170	230	66	84	29	26	149
Gladwin	217	-	2	44	9	16	3	4	3	1	8
Gogebic	295	-	7	55	16	11	-	11	-	4	13
Grand Traverse	474	-	4	88	25	32	5	4	5	3	14
Gratiot	404	-	1	72	20	11	8	6	-	4	23
Hillsdale	380	-	6	74	15	24	5	4	5	1	20
Houghton	444	-	2	109	18	30	9	18	6	-	28
Huron	419	-	1	98	24	27	5	11	6	6	19
Ingham	1,756	1	35	413	81	100	52	45	18	18	99
Ionia	417	-	3	87	25	18	4	7	4	8	21
Iosco	300	1	-	72	17	24	4	13	4	1	9
Iron	229	-	4	49	12	12	5	6	3	2	9
Isabella	338	-	2	66	19	17	8	6	1	1	14
Jackson	1,318	-	15	269	63	68	23	42	13	8	52
Kalamazoo	1,655	-	22	370	83	103	42	30	23	13	76
Kalkaska	113	-	1	24	2	5	1	4	-	6	6
Kent	3,642	1	37	823	193	191	96	93	38	32	180
Keweenaw	31	-	1	8	2	1	-	1	1	2	1
Lake	122	-	-	31	3	11	1	6	3	3	4

Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986(Continued)

AREA	All Causes	Tuberculosis All Forms	All Other Infectious and Parasitic Diseases	MALIGNANT NEOPLASMS							
				Total	Digestiva Organs and Peritoneum	Respiratory and Intrathoracic Organs	Breast	Genital Organs	Urinary Organs	Leukemia	Other
Lapeer	511	-	11	101	21	23	6	12	2	6	31
Leelanau	132	-	-	25	4	6	2	6	1	-	6
Lenawee	753	-	6	157	34	47	17	23	1	8	27
Livingston	641	-	2	128	33	36	7	19	8	4	21
Luce	63	-	-	14	4	6	-	1	1	-	2
Mackinac	150	-	1	39	8	14	5	5	1	3	3
Macomb	5,687	4	61	1,262	298	356	121	114	59	54	260
Manistee	291	-	3	57	7	14	8	6	3	-	19
Marquette	538	-	6	117	29	38	11	16	6	2	15
Mason	272	-	3	65	11	18	2	7	5	7	15
Mecosta	247	-	3	45	12	13	4	5	2	-	9
Menominee	273	-	3	67	19	15	8	4	3	3	15
Midland	470	-	3	120	37	28	7	13	6	7	22
Missaukee	111	-	-	19	5	6	1	-	3	-	4
Monroe	975	-	13	224	47	82	22	16	8	7	42
Montcalm	488	-	7	111	27	28	9	8	5	3	31
Montmorency	115	-	1	24	6	10	-	3	-	1	4
Muskegon	1,381	1	17	289	69	78	33	40	14	9	46
Newaygo	345	-	3	73	17	21	4	13	2	4	12
Oakland	7,985	3	92	1,776	444	434	186	167	96	79	370
Oceana	206	-	1	35	10	11	2	4	2	2	4
Ogemaw	202	-	1	43	9	13	2	7	1	3	8
Ontonagon	103	-	1	27	8	6	2	6	1	1	3
Osceola	221	-	1	52	15	12	3	7	1	3	11
Oscoda	98	-	4	25	4	8	2	3	1	2	5
Otsego	122	-	2	28	6	3	3	1	2	2	11
Ottawa	1,094	1	6	256	64	43	22	41	14	9	63
Presque Isle	149	-	1	25	1	8	2	3	2	2	7
Roscommon	266	-	2	75	17	22	6	11	2	6	11
Saginaw	1,831	-	15	412	91	118	38	54	18	13	80
St Clair	1,287	2	13	322	73	97	23	31	14	19	65
St Joseph	523	1	7	104	18	37	10	15	4	4	16
Sanilac	473	-	3	114	32	25	10	14	5	6	22
Schoolcraft	116	-	1	21	5	4	1	5	1	2	3
Shiawassee	569	-	2	133	24	30	22	9	5	8	35
Tuscola	416	-	4	78	22	17	7	4	5	5	18
Van Buren	644	-	5	152	36	46	14	17	5	7	27
Washtenaw	1,552	1	22	379	106	86	42	41	12	20	72
Wayne	22,639	21	331	4,604	1,169	1,331	405	526	174	149	850
Wexford	277	-	-	57	7	25	5	8	3	1	8
Co. Not Stated	31	-	1	2	-	-	-	-	-	-	2

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986 (Continued)

AREA	Diabetes Mellitus	Nutritional Deficiencies	Major Cardiovascular Diseases						Pneumonia and Influenza	Chronic Obstruct Pulmonary Diseases and Allied Conditions	Ulcer of Stomach and Duodenum	Chronic Liver Disease and Cirrhosis
			Total	Dis of the Heart	Hypertension with or without Renal Disease	Cerebrovascular Diseases	Atherosclerosis	Other Diseases of Arteries, Arterioles, and Capillaries				
Michigan	1,494	124	38,995	31,270	257	5,421	1,214	833	2,513	2,870	277	1,120
Alcona	-	2	71	56	-	9	3	3	2	8	1	-
Alger	2	-	62	47	-	12	1	2	5	3	-	-
Allegan	11	-	298	221	3	51	15	8	19	21	3	8
Alpena	5	-	168	147	1	16	1	3	6	4	-	4
Antrim	1	-	107	92	1	10	3	1	17	7	-	-
Arenac	1	-	77	63	-	10	2	2	6	6	4	2
Baraga	5	-	59	51	-	8	-	-	4	3	-	2
Barry	3	-	160	120	3	27	4	6	19	18	1	2
Bay	17	-	545	389	3	76	64	13	18	19	4	16
Benzie	5	-	56	43	1	7	4	1	1	10	-	1
Berrien	34	5	755	575	3	123	31	23	40	59	4	16
Branch	9	-	185	155	2	22	3	3	17	27	-	5
Calhoun	29	3	620	490	4	85	30	11	56	67	10	21
Cass	3	4	194	160	2	21	2	9	6	21	2	5
Charlevoix	1	-	100	89	1	9	1	-	6	8	-	2
Cheboygan	1	-	106	87	-	12	1	6	10	9	-	4
Chippewa	16	-	139	109	1	20	3	6	7	15	3	2
Clare	6	-	155	140	-	12	1	2	4	10	-	1
Clinton	8	-	158	110	2	34	8	4	9	11	2	6
Crawford	3	3	55	37	1	11	5	1	5	2	-	-
Delta	11	-	205	158	2	35	3	7	6	16	4	5
Dickinson	8	1	163	115	2	33	12	1	12	15	1	5
Eaton	9	3	305	239	3	46	11	6	16	20	3	4
Emmet	1	-	117	96	1	15	1	6	17	9	-	4
Genesee	65	3	1,689	1,357	11	236	57	28	76	115	10	40
Gladwin	4	-	113	96	1	7	6	3	6	10	1	5
Gogebic	5	2	138	114	-	22	1	1	10	11	2	4
Grand Traverse	8	3	228	174	1	36	14	3	25	14	3	7
Gratiot	4	-	226	155	-	60	7	4	16	19	2	2
Hillsdale	9	-	189	156	-	22	6	5	18	17	-	3
Houghton	8	-	242	174	1	52	9	6	13	10	1	4
Huron	6	-	210	152	-	51	4	3	19	10	1	8
Ingham	40	4	786	603	2	130	34	17	49	63	5	11
Ionia	12	1	186	143	1	26	12	4	12	18	4	5
Iosco	-	-	155	130	1	12	7	5	7	10	-	3
Iron	7	-	103	73	-	20	2	8	13	11	-	1
Isabella	7	-	166	133	-	23	5	5	15	16	1	2
Jackson	20	3	623	502	7	83	21	10	46	90	2	11
Kalamazoo	25	4	724	555	6	121	21	21	90	76	12	12
Kalkaska	3	-	53	37	1	7	5	3	5	1	1	-
Kent	66	7	1,695	1,268	12	291	79	45	163	131	12	39
Keweenaw	1	-	17	11	-	5	1	-	1	1	-	-

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986 (Continued)

AREA	Diabetes Mellitus	Nutritional Deficiencies	Major Cardiovascular Diseases						Pneumonia and Influenza	Chronic Obstruct Pulmonary Diseases and Allied Conditions	Ulcer of Stomach and Duodenum	Chronic Liver Disease and Cirrhosis
			Total	Dis of the Heart	Hypertension with or without Renal Disease	Cerebrovascular Diseases	Atherosclerosis	Other Diseases of Arteries, Arterioles, and Capillaries				
Lake	1	1	60	46	-	9	3	2	6	1	-	1
Lapeer	17	-	226	177	1	32	8	8	15	20	3	4
Leelanau	3	1	67	55	-	10	-	2	3	8	-	1
Lenawee	17	2	340	238	2	75	17	8	33	49	5	5
Livingston	19	2	339	271	3	50	5	10	18	24	2	8
Luce	2	-	28	24	-	3	-	1	2	5	1	1
Mackinac	3	1	69	57	-	10	-	2	2	7	-	2
Macomb	97	8	2,948	2,425	12	357	98	56	175	186	14	85
Manistee	5	-	155	99	-	31	19	6	10	11	2	7
Marquette	7	1	283	228	1	38	11	5	18	15	1	3
Mason	4	-	142	109	1	20	8	4	7	8	-	6
Mecosta	8	-	127	107	1	16	-	3	11	9	1	3
Menominee	14	2	115	88	-	15	9	3	9	9	2	-
Midland	7	2	214	161	1	36	10	6	12	13	1	2
Missaukee	-	-	61	45	4	9	2	1	2	2	1	-
Monroe	22	1	468	381	2	68	6	11	33	43	-	14
Montcalm	10	-	219	166	2	34	7	10	23	15	1	3
Montmorency	2	-	60	51	-	6	-	3	1	5	-	3
Muskegon	20	4	696	548	10	107	20	11	45	50	5	14
Newaygo	3	-	166	137	1	17	8	3	12	16	1	-
Oakland	129	7	4,063	3,289	20	580	90	84	201	291	27	88
Oceana	7	1	110	90	3	10	5	2	12	5	1	2
Ogemaw	6	1	107	79	1	11	13	3	9	10	-	1
Ontonagon	6	-	49	27	-	13	7	2	-	1	-	2
Osceola	2	-	98	73	-	17	3	5	16	7	3	1
Oscoda	-	-	53	39	-	9	2	3	1	5	2	3
Otsego	1	-	53	45	-	5	1	2	9	2	-	1
Ottawa	20	3	522	394	2	81	30	15	47	35	5	13
Presque Isle	2	-	90	76	-	13	-	1	2	7	-	2
Roscommon	5	-	130	112	1	11	3	3	7	10	-	4
Saginaw	29	1	869	659	8	145	30	27	55	83	7	20
St Clair	33	1	601	483	5	85	14	14	40	49	4	22
St Joseph	13	-	263	204	-	31	17	11	18	24	3	-
Sanilac	10	2	235	197	2	30	-	6	15	14	3	6
Schoolcraft	4	1	46	34	1	7	1	3	7	5	1	-
Shiawassee	13	1	273	192	2	64	13	2	17	22	4	6
Tuscola	11	1	198	164	-	26	8	-	12	27	2	3
Van Buren	21	1	301	246	5	31	10	9	16	25	2	4
Washtenaw	28	-	638	491	3	103	24	17	62	64	6	15
Wayne	411	29	10,961	9,238	84	1,275	197	167	619	663	68	485
Wexford	3	1	141	95	-	23	16	7	18	13	-	6
Co. Not Stated	-	-	8	8	-	-	-	-	-	1	-	2

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986 (Continued)

AREA	Nephritis, Nephrotic Syndrome and Nephrosis	Complications of Pregnancy, Childbx and the Puerperium	Congenital Anomalies	Certain Conditions Originating in the Perinatal Period	Symptoms, Signs, and Ill-defined Conditions	All Other Dis	ACCIDENTS			Suicide	Homicide and Legal Intervention	All Other External Causes
							Total	Motor Vehicle	All Other			
Michigan	840	11	505	849	419	6,420	3,202	1,736	1,466	1,119	1,115	138
Alcona	1	-	1	-	-	13	4	3	1	-	-	-
Alger	-	-	1	-	-	6	6	3	3	1	-	-
Allegan	9	-	10	4	8	42	25	14	11	10	2	-
Alpena	2	-	1	3	1	23	16	10	6	3	-	-
Antrim	2	-	3	-	-	13	15	6	9	3	-	-
Arenac	1	-	-	-	1	17	5	4	1	1	-	-
Baraga	1	-	-	1	1	5	1	-	1	-	-	-
Barry	3	-	3	7	-	41	28	21	7	5	3	-
Bay	10	-	8	7	4	57	42	29	13	19	-	-
Benzie	1	-	-	1	-	15	7	1	6	1	-	-
Berrien	24	-	7	16	11	153	67	40	27	15	9	1
Branch	3	-	7	5	-	29	20	13	7	4	-	-
Calhoun	14	1	12	7	8	87	60	36	24	15	12	-
Cass	5	-	3	2	9	43	25	14	11	5	4	-
Charlevoix	2	-	2	1	-	11	9	6	3	3	-	-
Cheboygan	2	-	-	1	3	15	11	9	2	5	-	-
Chippewa	3	-	1	-	-	25	9	3	6	3	2	-
Clare	2	-	-	3	2	7	13	7	6	5	-	-
Clinton	4	-	4	3	1	30	30	18	12	11	2	-
Crawford	-	-	-	-	1	12	5	4	1	3	-	-
Delta	2	-	2	1	1	28	12	6	6	6	1	-
Dickinson	4	-	1	2	7	32	17	8	9	7	1	1
Eaton	4	-	4	4	-	51	30	14	16	6	3	-
Emmet	6	-	1	-	-	11	8	3	5	3	-	-
Genesee	35	-	26	59	20	258	189	117	72	52	74	6
Gladwin	1	-	-	1	-	14	13	9	4	3	-	-
Gogebic	-	-	2	1	2	32	20	4	16	6	-	-
Grand Traverse	3	-	3	3	6	48	24	9	15	7	1	1
Gratiot	5	-	1	2	1	33	16	6	10	4	-	-
Hillsdale	2	-	1	1	2	23	27	16	11	4	4	-
Houghton	7	-	2	1	2	30	9	5	4	4	-	-
Huron	2	-	3	4	1	30	23	5	18	3	-	-
Ingham	20	-	13	28	12	160	71	32	39	36	12	1
Ionia	5	-	5	6	5	28	29	17	12	10	2	-
Iosco	2	-	1	5		26	10	8	2	2	1	-
Iron	1	-	-	-	2	30	5	3	2	2	1	-
Isabella	7	-	3	1	1	16	27	18	9	7	1	-
Jackson	19	1	9	12	15	106	54	35	19	14	12	-
Kalamazoo	13	1	12	27	7	155	83	39	44	21	5	-
Kalkaska	2	-	1	1	2	12	11	7	4	2	-	-
Kent	45	1	38	27	22	314	148	77	71	48	29	3
Keweenaw	1	-	-	-	-	-	1	1	-	-	-	-

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1986 (Continued)

AREA	Nephritis, Nephrotic Syndrome and Nephrosis	Complications of Pregnancy, Childb and the Puerperium	Congenital Anomalies	Certain Conditions Originating in the Perinatal Period	Symptoms, Signs, and Ill-defined Conditions	All Other Dis	ACCIDENTS			Suicide	Homicide and Legal Intervention	All Other External Causes
							Total	Motor Vehicle	All Other			
Lake	2	-	-	2	2	10	4	3	1	-	2	-
Lapeer	11	-	6	3	-	49	30	25	5	13	2	-
Leelanau	2	-	-	2	2	14	3	1	2	1	1	-
Lenawee	9	-	2	6	5	71	35	27	8	13	-	-
Livingston	7	-	4	6	3	41	30	21	9	9	1	-
Luce	2	-	-	1	-	3	3	2	1	1	-	-
Mackinac	1	-	-	-	-	9	14	5	9	3	-	-
Macomb	46	-	35	42	16	396	195	107	88	96	27	2
Manistee	3	-	1	2	2	25	6	3	3	1	1	-
Marquette	2	-	2	4	1	50	21	7	14	6	1	1
Mason	1	-	2	-	-	19	12	8	4	3	-	-
Mecosta	2	-	1	2	3	19	11	7	4	1	1	-
Menominee	1	-	2	5	2	26	16	10	6	2	-	-
Midland	3	-	1	1	3	53	27	21	6	10	-	-
Missaukee	1	-	2	-	2	11	7	2	5	2	-	1
Monroe	6	-	8	14	7	69	34	24	10	12	7	1
Montcalm	5	-	1	4	3	45	35	16	19	3	2	1
Montmorency	1	-	1	1	-	9	7	2	5	-	-	-
Muskegon	13	1	14	13	6	123	52	25	27	16	6	-
Newaygo	4	-	2	1	3	30	27	21	6	4	-	-
Oakland	76	1	43	81	27	604	266	153	113	138	57	22
Oceana	1	-	1	2	-	17	7	2	5	3	2	-
Ogemaw	3	-	-	-	-	10	7	4	3	5	-	-
Ontonagon	1	-	-	1	-	6	8	3	5	1	-	-
Osceola	2	-	3	3	-	19	12	6	6	2	-	-
Oscoda	1	-	-	-	-	1	-	-	-	2	1	-
Otsego	2	-	1	1	2	9	6	3	3	3	2	-
Ottawa	12	-	5	11	8	86	59	37	22	7	-	1
Presque Isle	1	-	-	1	-	15	3	3	-	-	-	-
Roscommon	-	-	-	1	-	20	8	7	1	3	1	-
Saginaw	16	-	7	25	6	139	87	39	48	26	34	1
St Clair	12	-	8	10	6	90	54	36	18	19	2	-
St Joseph	5	-	6	3	7	43	23	13	10	4	4	-
Sanilac	6	-	7	2	1	29	19	10	9	6	3	-
Schoolcraft	2	-	-	1	2	15	7	1	6	3	1	-
Shiawassee	3	-	4	2	5	46	31	20	11	7	1	-
Tuscola	8	-	3	3	3	21	38	23	15	5	-	-
Van Buren	11	-	4	9	2	46	33	16	17	5	7	1
Washtenaw	17	1	14	21	9	164	75	35	40	24	10	2
Wayne	262	4	121	313	123	1,868	647	298	349	297	752	89
Wexford	2	-	3	1	-	18	11	5	6	4	-	-
Co. Not Stated	-	-	-	2	-	1	7	5	2	-	6	1

Table 4.15
Reported Cases of Certain Communicable Diseases by County
Michigan Residents, 1986

AREA	TOTAL	GONORRHEA	CHICKEN POX	HEPATITIS (ALL TYPES)	SAMONELLA INFECTIONS	TUBERCULOSIS	SYPHILIS	MUMPS	DYSENTERY BACILLARY	MEASLES	RUBELLA	MENINGOCOCCAL INFECTIONS	WHOOPING COUGH
Michigan	82551	37929	40996	1266	1289	619	584	467	155	106	24	81	35
Alcona	6	1	3	2	-	0	-	-	-	-	-	-	0
Alger	8	2	5	-	-	0	1	-	-	-	-	-	0
Allegan	311	55	220	13	11	3	2	4	1	-	-	1	1
Alpena	58	8	41	5	2	0	-	1	-	-	1	-	0
Antrim	27	3	23	-	1	0	-	-	-	-	-	-	0
Aranac	29	5	23	-	-	0	-	-	-	-	-	-	1
Baraga	32	-	31	-	1	0	-	-	-	-	-	-	0
Barry	157	47	99	3	4	2	-	-	2	-	-	-	0
Bay	801	74	691	4	17	7	3	-	2	-	-	-	3
Benzie	68	3	64	-	1	0	-	-	-	-	-	-	0
Berrien	2279	1349	506	34	38	19	7	317	2	2	1	1	3
Branch	250	70	163	3	6	4	1	1	-	-	1	1	0
Calhoun	959	618	267	18	25	6	2	9	9	-	1	3	1
Cass	354	94	229	2	4	5	1	17	2	-	-	-	0
Charlevoix	25	4	17	1	2	0	-	-	-	-	-	1	0
Cheboygan	128	4	121	2	1	0	-	-	-	-	-	-	0
Chippewa	57	24	29	1	1	1	1	-	-	-	-	-	0
Clare	13	6	2	2	1	1	-	-	-	-	-	1	0
Clinton	82	29	37	4	10	0	1	-	-	-	-	1	0
Crawford	111	6	103	-	-	0	1	-	-	-	-	1	0
Delta	258	9	240	1	3	1	2	-	2	-	-	-	0
Dickinson	191	5	183	1	2	0	-	-	-	-	-	-	0
Eaton	259	69	176	8	2	0	-	1	2	1	-	-	0
Emmet	66	10	52	1	1	2	-	-	-	-	-	-	0
Genesee	4273	2516	1621	50	41	17	15	4	3	-	1	5	0
Gladwin	14	2	11	-	-	1	-	-	-	-	-	-	0
Gogebic	1	-	-	-	-	1	-	-	-	-	-	-	0
Gd. Traverse	298	53	225	4	12	1	-	-	2	-	-	1	0
Gratiot	125	10	99	6	3	1	1	4	-	-	-	1	0
Hillsdale	588	18	564	4	2	0	-	-	-	-	-	-	0
Houghton	93	32	53	1	4	2	-	1	-	-	-	-	0
Huron	237	-	230	2	2	1	1	-	-	-	-	-	1
Ingham	3888	1860	1858	53	68	18	18	3	7	1	-	2	0
Ionia	341	31	288	16	3	0	1	1	-	-	-	-	1
Iosco	91	-	89	2	-	0	-	-	-	-	-	-	0
Iron	33	2	25	3	2	1	-	-	-	-	-	-	0
Isabella	95	36	33	1	22	0	2	1	-	-	-	-	0
Jackson	798	548	191	7	20	4	11	13	-	2	-	2	0
Kalamazoo	1703	1230	368	36	28	10	4	-	20	-	-	5	2
Kalkaska	46	-	46	-	-	0	-	-	-	-	-	-	0
Kent	7120	2817	4063	103	37	41	36	10	12	-	-	1	0
Keweenaw	1	1	-	-	-	0	-	-	-	-	-	-	0
Lake	37	8	26	-	1	1	-	1	-	-	-	-	0
Lapeer	734	37	665	4	9	0	1	6	-	9	-	1	2

Table 4.15
Reported Cases of Certain Communicable Diseases by County, 1986 (Continued)

AREA	TOTAL	GONORRHEA	CHICKEN POX	HEPATITIS (ALL TYPES)	SAMONELLA INFECTIONS	TUBERCULOSIS	SYPHILIS	MUMPS	DYSENTERY BACILLARY	MEASLES	RUBELLA	MENINGOCOCCAL INFECTIONS	WHOOPING COUGH
Leelanau	51	2	45	-	2	0	-	-	1	-	1	-	0
Lenawee	506	129	349	8	14	0	3	1	2	-	-	-	0
Livingston	319	35	261	6	8	4	1	2	1	-	1	-	0
Luce	8	4	3	1	-	0	-	-	-	-	-	-	0
Mackinac	35	14	20	-	-	0	-	-	-	-	-	1	0
Macomb	5362	610	4440	116	107	32	21	16	5	6	1	7	1
Manistee	25	2	19	1	2	0	-	-	-	-	-	1	0
Marquette	210	134	70	2	1	0	1	-	1	-	-	1	0
Mason	79	19	57	1	-	2	-	-	-	-	-	-	0
Mecosta	279	91	185	1	2	0	-	-	-	-	-	-	0
Menominee	128	4	118	5	-	1	-	-	-	-	-	-	0
Midland	109	41	51	3	11	1	-	1	-	-	-	1	0
Missaukee	4	2	2	-	-	0	-	-	-	-	-	-	0
Monroe	467	71	357	7	17	5	3	3	2	-	-	1	1
Montcalm	231	56	162	4	4	3	-	-	-	-	-	2	0
Montmorency	90	1	85	-	1	0	2	1	-	-	-	-	0
Muskegon	1359	730	551	30	16	17	7	-	6	-	-	-	2
Newaygo	292	38	243	8	1	1	-	-	-	-	-	1	0
Oakland	8133	1794	5880	155	158	53	33	24	17	-	11	5	3
Oceana	59	3	49	2	2	1	1	-	-	-	-	1	0
Ogemaw	124	-	117	2	2	1	-	1	-	-	-	-	1
Ontonagon	3	-	1	-	1	1	-	-	-	-	-	-	0
Osceola	23	2	21	-	-	0	-	-	-	-	-	-	0
Oscoda	12	1	9	-	-	2	-	-	-	-	-	-	0
Otsego	122	4	118	-	-	0	-	-	-	-	-	-	0
Ottawa	808	92	650	13	26	2	7	4	13	-	-	1	0
Presque Isle	7	1	2	-	2	1	1	-	-	-	-	-	0
Roscommon	169	4	164	-	-	1	-	-	-	-	-	-	0
Saginaw	2530	1430	1002	26	35	16	9	5	2	1	-	1	3
St. Clair	1006	238	696	15	20	5	-	-	1	30	-	1	0
St. Joseph	454	76	340	26	5	0	2	1	-	-	2	1	1
Sanilac	319	5	313	1	-	0	-	-	-	-	-	-	0
Schoolcraft	26	8	17	-	-	0	-	1	-	-	-	-	0
Shiawasee	419	25	376	9	6	0	-	1	1	-	-	1	0
Tuscola	49	12	31	-	5	0	-	-	1	-	-	-	0
Van Buren	325	83	228	4	4	0	1	-	3	-	2	-	0
Washtenaw	1038	775	147	19	52	12	19	1	7	5	-	1	0
Wayne	31217	15684	9953	399	392	307	361	11	26	49	1	26	8
Wexford	109	13	84	5	6	1	-	-	-	-	-	-	0

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
	I. INFECTIOUS AND PARASITIC DISEASES (001-139)	
3	Other salmonella infections	1
8	Intestinal infections due to other organisms	6
9	Ill-defined intestinal infections	9
11	Pulmonary tuberculosis	36
13	Tuberculosis of meninges and central nervous system	3
15	Tuberculosis of bones and joints	2
17	Tuberculosis of other organs	1
18	Miliary tuberculosis	2
27	Other zoonotic bacterial diseases	3
31	Diseases due to other mycobacteria	6
36	Meningococcal infection	15
38	Septicemia	659
39	Actinomycotic infections	1
40	Other bacterial diseases	3
41	Bacterial infection in conditions classified elsewhere and of unspecified site	16
46	Slow virus infection of central nervous system	7
47	Meningitis due to enterovirus	1
49	Other non-arthropod-borne viral diseases of central nervous system	9
52	Chickenpox	1
53	Herpes zoster	8
54	Herpes simplex	11
70	Viral hepatitis	24
74	Specific diseases due to Coxsackie virus	1
75	Infectious mononucleosis	1
78	Other diseases due to viruses and Chlamydiae	12
79	Viral infection in conditions classified elsewhere and of unspecified site	10
93	Cardiovascular syphilis	1
94	Neurosyphilis	1
112	Candidiasis	28
114	Coccidioidomycosis	1
116	Blastomycotic infection	3
117	Other mycoses	20
130	Toxoplasmosis	2
135	Sarcoidosis	18
136	Other and unspecified infectious and parasitic diseases	39
137	Late effects of tuberculosis	2
138	Late effects of acute poliomyelitis	5
139	Late effects of other infectious and parasitic diseases	1
	II. NEOPLASMS (140-239)	
141	Malignant neoplasm of tongue	91
142	Malignant neoplasm of major salivary glands	22
143	Malignant neoplasm of gum	5
144	Malignant neoplasm of floor of mouth	9
145	Malignant neoplasm of other and unspecified parts of mouth	58
146	Malignant neoplasm of oropharynx	40
147	Malignant neoplasm of nasopharynx	15
148	Malignant neoplasm of hypopharynx	20
149	Malignant neoplasm of other and ill-defined sites within the lip, oral cavity and pharynx	49
150	Malignant neoplasm of oesophagus	368
151	Malignant neoplasm of stomach	460
152	Malignant neoplasm of small intestine, including duodenum	28
153	Malignant neoplasm of colon	1717
154	Malignant neoplasm of rectum, rectosigmoid junction and anus	250
155	Malignant neoplasm of liver and intrahepatic bile ducts	248
156	Malignant neoplasm of gallbladder and extrahepatic bile ducts	152
157	Malignant neoplasm of pancreas	872
158	Malignant neoplasm of retroperitoneum and peritoneum	21

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
159	Malignant neoplasm of other and ill-defined sites within the digestive organs and peritoneum	73
160	Malignant neoplasm of nasal cavities, middle ear and accessory sinuses	19
161	Malignant neoplasm of larynx	147
162	Malignant neoplasm of trachea, bronchus and lung	4554
163	Malignant neoplasm of pleura	20
164	Malignant neoplasm of thymus, heart and mediastinum	15
165	Malignant neoplasm of other and ill-defined sites within the respiratory system and intrathoracic organs	2
170	Malignant neoplasm of bone and articular cartilage	39
171	Malignant neoplasm of connective and other soft tissue	97
172	Malignant melanoma of skin	153
173	Other malignant neoplasm of skin	46
174	Malignant neoplasm of female breast	1546
175	Malignant neoplasm of male breast	12
179	Malignant neoplasm of uterus, part unspecified	125
180	Malignant neoplasm of cervix uteri	159
182	Malignant neoplasm of body of uterus	108
183	Malignant neoplasm of ovary and other uterine adnexa	453
184	Malignant neoplasm of other and unspecified female genital organs	42
185	Malignant neoplasm of prostate	1001
186	Malignant neoplasm of testis	14
187	Malignant neoplasm of penis and other male genital organs	13
188	Malignant neoplasm of bladder	398
189	Malignant neoplasm of kidney and other and unspecified urinary organs	368
190	Malignant neoplasm of eye	7
191	Malignant neoplasm of brain	456
192	Malignant neoplasm of other and unspecified parts of nervous system	16
193	Malignant neoplasm of thyroid gland	33
194	Malignant neoplasm of other endocrine glands and related structures	27
195	Malignant neoplasm of other and ill-defined sites	136
199	Malignant neoplasm without specification of site	1148
200	Lymphosarcoma and reticulosarcoma	118
201	Hodgkin's disease	63
202	Other malignant neoplasm of lymphoid and histiocytic tissue	513
203	Multiple myeloma and immunoproliferative neoplasms	285
204	Lymphoid leukemia	176
205	Myeloid leukemia	299
206	Monocytic leukemia	12
207	Other specified leukemia	9
208	Leukemia of unspecified cell type	174
211	Benign neoplasm of other parts of digestive system	2
212	Benign neoplasm of respiratory and intrathoracic organs	7
215	Other benign neoplasm of connective and other soft tissue	2
217	Benign neoplasm of breast	1
220	Benign neoplasm of ovary	1
225	Benign neoplasm of brain and other parts of nervous system	37
227	Benign neoplasm of other endocrine glands and related structures	6
228	Hemangioma and lymphangioma, any site	1
235	Neoplasm of uncertain behavior of digestive and respiratory systems	5
236	Neoplasm of uncertain behavior of genitourinary organs	2
237	Neoplasm of uncertain behavior of endocrine glands and nervous system	8
238	Neoplasm of uncertain behavior of other and unspecified sites and tissues	41
239	Neoplasm of unspecified nature	40
	III. ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES AND IMMUNITY DISORDERS (240-279)	
242	Thyrotoxicosis with or without goitre	3
244	Acquired hypothyroidism	11
246	Other disorders of thyroid	1
250	Diabetes mellitus	1494
251	Other disorders of pancreatic internal secretion	11
252	Disorders of parathyroid gland	3

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
253	Disorders of the pituitary gland and its hypothalamic control	2
255	Disorders of adrenal glands	8
259	Other endocrine disorders	3
260	Kwashiorkor	1
261	Nutritional marasmus	13
262	Other severe protein-calorie malnutrition	2
263	Other and unspecified protein-calorie malnutrition	99
265	Thiamine and niacin deficiency states	3
266	Deficiency of B-complex components	1
269	Other nutritional deficiencies	6
270	Disorders of amino-acid transport and metabolism	1
271	Disorders of carbohydrate transport and metabolism	6
272	Disorders of lipoid metabolism	18
273	Disorders of plasma protein metabolism	21
274	Gout	3
275	Disorders of mineral metabolism	13
276	Disorders of fluid, electrolyte and acid-base balance	191
277	Other and unspecified disorders of metabolism	66
278	Obesity and other hyperalimentation	42
279	Disorders involving the immune mechanism	65
	IV. DISEASES OF BLOOD AND BLOOD-FORMING ORGANS (280-289)	
280	Iron deficiency anemias	7
281	Other deficiency anemias	3
282	Hereditary hemolytic anemias	15
283	Acquired hemolytic anemias	4
284	Aplastic anemia	37
285	Other and unspecified anemias	52
286	Coagulation defects	50
287	Purpura and other hemorrhagic conditions	30
288	Diseases of white blood cells	27
289	Other diseases of blood and blood-forming organs	56
	V. MENTAL DISORDERS (290-319)	
290	Senile and presenile organic psychotic conditions	102
291	Alcoholic psychoses	7
293	Transient organic psychotic conditions	1
294	Other organic psychotic conditions (chronic)	1
295	Schizophrenic psychoses	3
296	Affective psychoses	3
297	Paranoid states	1
298	Other nonorganic psychoses	44
299	Psychoses with origin specific to childhood	1
300	Neurotic disorders	2
303	Alcohol dependence syndrome	134
304	Drug dependence	29
305	Nondependent abuse of drugs	248
307	Special symptoms or syndromes not elsewhere classified	7
308	Acute reaction to stress	1
309	Adjustment reaction	1
310	Specific nonpsychotic mental disorders following organic brain damage	154
311	Depressive disorder, not elswhere classified	8
318	Other specified mental retardation	5
319	Unspecified mental retardation	4
	VI. DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (320-389)	
320	Bacterial meningitis	25
322	Meningitis of unspecified cause	10
323	Encephalitis, myelitis and encephalomyelitis	4
324	Intracranial and intraspinal abscess	10
330	Cerebral degenerations usually manifest in childhood	6

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
331	Other cerebral degenerations	302
332	Parkinson's disease	179
333	Other extrapyramidal disease and abnormal movement disorders	24
334	Spinocerebellar disease	13
335	Anterior horn cell disease	126
336	Other diseases of spinal cord	6
340	Multiple sclerosis	75
341	Other demyelinating diseases of central nervous system	1
342	Hemiplegia	11
343	Infantile cerebral palsy	27
344	Other paralytic syndromes	27
345	Epilepsy	115
348	Other conditions of brain	129
349	Other and unspecified disorders of the nervous system	10
356	Hereditary and idiopathic peripheral neuropathy	7
357	Inflammatory and toxic neuropathy	5
358	Myoneural disorders	14
359	Muscular dystrophies and other myopathies	40
376	Disorders of the orbit	1
382	Suppurative and unspecified otitis media	4
	VII. DISEASES OF THE CIRCULATORY SYSTEM (390-459)	
391	Rheumatic fever with heart involvement	2
394	Diseases of mitral valve	92
395	Diseases of aortic valve	11
396	Diseases of mitral and aortic valves	31
397	Diseases of other endocardial structures	19
398	Other rheumatic heart disease	66
401	Essential hypertension	119
402	Hypertensive heart disease	622
403	Hypertensive renal disease	138
404	Hypertensive heart and renal disease	89
410	Acute myocardial infarction	10763
411	Other acute and subacute form of ischemic heart disease	63
412	Old myocardial infarction	44
413	Angina pectoris	42
414	Other forms of chronic ischemic heart disease	10953
415	Acute pulmonary heart disease	267
416	Chronic pulmonary heart disease	82
417	Other diseases of pulmonary circulation	1
420	Acute pericarditis	5
421	Acute and subacute endocarditis	37
422	Acute myocarditis	17
423	Other diseases of pericardium	22
424	Other diseases of endocardium	334
425	Cardiomyopathy	639
426	Conduction disorders	34
427	Cardiac dysrhythmias	1516
428	Heart failure	1620
429	Ill-defined descriptions and complications of heart disease	3899
430	Subarachnoid hemorrhage	250
431	Intracerebral hemorrhage	642
432	Other and unspecified intracranial hemorrhage	126
433	Occlusion and stenosis of precerebral arteries	53
434	Occlusion of cerebral arteries	1081
435	Transient cerebral ischemia	18
436	Acute but ill-defined cerebrovascular disease	2538
437	Other and ill-defined cerebrovascular disease	417
438	Late effects of cerebrovascular disease	256
440	Atherosclerosis	1214
441	Aortic aneurysm	573
442	Other aneurysm	28
443	Other peripheral vascular disease	87

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
444	Arterial embolism and thrombosis	64
446	Polyarteritis nodosa and allied conditions	30
447	Other disorders of arteries and arterioles	50
448	Diseases of capillaries	1
451	Phlebitis and thrombophlebitis	68
453	Other venous embolism and thrombosis	24
454	Varicose veins of lower extremities	11
455	Hemorrhoids	1
456	Varicose veins of other sites	21
457	Noninfective disorders of lymphatic channels	1
458	Hypotension	44
459	Other disorders of circulatory system	29
	VIII. DISEASES OF THE RESPIRATORY SYSTEM (460-519)	
464	Acute laryngitis and tracheitis	1
465	Acute upper respiratory infections of multiple or unspecified sites	10
466	Acute bronchitis and bronchiolitis	23
474	Chronic disease of tonsils and adenoids	1
475	Peritonsillar abscess	1
477	Allergic rhinitis	1
478	Other diseases of upper respiratory tract	8
480	Viral pneumonia	30
481	Pneumococcal pneumonia	83
482	Other bacterial pneumonia	112
483	Pneumonia due to other specified organism	12
485	Bronchopneumonia, organism unspecified	206
486	Pneumonia, organism unspecified	1946
487	Influenza	124
490	Bronchitis, not specified as acute or chronic	21
491	Chronic bronchitis	127
492	Emphysema	701
493	Asthma	130
494	Bronchiectasis	19
496	Chronic airways obstruction, not elsewhere classified	1872
500	Coalworkers' pneumoconiosis	3
501	Asbestosis	2
502	Pneumoconiosis due to other silica or silicates	3
505	Pneumoconiosis, unspecified	2
506	Respiratory conditions due to chemical fumes and vapors	1
507	Pneumonitis due to solids and liquids	248
508	Respiratory conditions due to other and unspecified external agents	1
510	Empyema	21
511	Pleurisy	30
512	Pneumothorax	18
513	Abscess of lung and mediastinum	25
514	Pulmonary congestion and hypostasis	18
515	Postinflammatory pulmonary fibrosis	176
516	Other alveolar and parietoalveolar pneumopathy	38
518	Other diseases of lung	185
519	Other diseases of respiratory system	43
	IX. DISEASES OF THE DIGESTIVE SYSTEM (520-579)	
522	Diseases of pulp and periapical tissues	2
523	Gingival and periodontal diseases	1
530	Diseases of oesophagus	47
531	Gastric ulcer	89
532	Duodenal ulcer	85
533	Peptic ulcer, site unspecified	103
534	Gastrojejunal ulcer	2
535	Gastritis and duodenitis	43
536	Disorders of function of stomach	5
537	Other disorders of stomach and duodenum	17

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
540	Acute appendicitis	16
541	Appendicitis, unqualified	1
550	Inguinal hernia	8
551	Other hernia of abdominal cavity, with gangrene	4
552	Other hernia of abdominal cavity with obstruction, without mention of gangrene	15
553	Other hernia of abdominal cavity without mention of obstruction or gangrene	16
555	Regional enteritis	13
556	Idiopathic proctocolitis	11
557	Vascular insufficiency of intestine	212
558	Other noninfective gastroenteritis and colitis	37
560	Intestinal obstruction without mention of hernia	142
562	Diverticula of intestine	92
564	Functional digestive disorders, not elsewhere classified	4
566	Abscess of anal and rectal regions	4
567	Peritonitis	59
568	Other disorders of peritoneum	5
569	Other disorders of intestine	68
570	Acute and subacute necrosis of liver	22
571	Chronic liver disease and cirrhosis	1120
572	Liver abscess and sequelae of chronic liver disease	136
573	Other disorders of liver	47
574	Cholelithiasis	35
575	Other disorders of gallbladder	49
576	Other disorders of biliary tract	32
577	Diseases of pancreas	120
578	Gastrointestinal hemorrhage	195
579	Intestinal malabsorption	5
	X. DISEASES OF THE GENITOURINARY SYSTEM (580-629)	
580	Acute glomerulonephritis	4
581	Nephrotic syndrome	4
582	Chronic glomerulonephritis	39
583	Nephritis and nephropathy, not specified as acute or chronic	18
584	Acute renal failure	154
585	Chronic renal failure	220
586	Renal failure, unspecified	389
587	Renal sclerosis, unspecified	4
588	Disorders resulting from impaired renal function	5
590	Infections of kidney	50
591	Hydronephrosis	4
592	Calculus of kidney and ureter	20
593	Other disorders of kidney and ureter	70
595	Cystitis	10
596	Other disorders of bladder	8
598	Urethral stricture	1
599	Other disorders of urethra and urinary tract	359
600	Hyperplasia of prostate	6
601	Inflammatory diseases of prostate	2
602	Other disorders of prostate	4
604	Orchitis and epididymitis	1
607	Disorders of penis	1
608	Other disorders of male genital organs	2
611	Other disorders of breast	1
614	Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue and peritoneum	5
617	Endometriosis	1
618	Genital prolapse	3
619	Fistulae involving female genital tract	2
	XI. COMPLICATIONS OF PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM (630-676)	
633	Ectopic pregnancy	1

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
642	Hypertension complicating pregnancy, childbirth and the puerperium	1
647	Infective and parasitic conditions in the mother classifiable elsewhere but complications of pregnancy, childbirth and the puerperium	1
648	Other current conditions in the mother classifiable elsewhere but complicating pregnancy, childbirth and the puerperium	1
651	Multiple gestation	1
669	Other complications of labor and delivery, not elsewhere classified	1
671	Venous complications in pregnancy and the puerperium	2
673	Obstetrical pulmonary embolism	3
	XII. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (680-709)	
682	Other cellulitis and abscess	27
686	Other local infections of skin and subcutaneous tissue	6
693	Dermatitis due to taken internally substances	1
694	Bullous dermatoses	2
695	Erythematous conditions	8
696	Psoriasis and similar disorders	1
707	Chronic ulcer of skin	100
	XIII. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (710-739)	
710	Diffuse diseases of connective tissue	101
711	Arthropathy associated with infections	6
714	Rheumatoid arthritis and other inflammatory polyarthropathies	42
715	Osteoarthrosis and allied disorders	22
716	Other and unspecified arthropathies	11
718	Other derangement of joint	4
719	Other and unspecified disorder of joint	1
720	Ankylosing spondylitis and other inflammatory spondylopathies	1
721	Spondylosis and allied disorders	3
722	Intervertebral disc disorders	1
724	Other and unspecified disorders of back	2
728	Disorders of muscle, ligament and fascia	5
729	Other disorders of soft tissues	8
730	Osteomyelitis, periostitis and other infections involving bone	24
731	Osteitis deformans and osteopathies associated with other disorders classified elsewhere	3
733	Other disorders of bone and cartilage	8
737	Curvature of spine	8
	XIV. CONGENITAL ANOMALIES (740-759)	
740	Anencephalus and similar anomalies	23
741	Spina bifida	9
742	Other congenital anomalies of nervous system	47
743	Congenital anomalies of eye	1
745	Bulbus cordis anomalies and anomalies of cardiac septal closure	39
746	Other congenital anomalies of heart	131
747	Other congenital anomalies of circulatory system	43
748	Congenital anomalies of respiratory system	47
749	Cleft palate and cleft lip	2
750	Other congenital anomalies of upper alimentary tract	4
751	Other congenital anomalies of digestive system	9
753	Congenital anomalies of urinary system	33
756	Other congenital musculoskeletal anomalies	22
758	Chromosomal anomalies	51
759	Other and unspecified congenital anomalies	41
	XV. CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD (760-779)	
760	Fetus or newborn affected by maternal conditions which may be unrelated to present pregnancy	4
761	Fetus or newborn affected by maternal complications of pregnancy	74

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
762	Fetus or newborn affected by complications of placenta, cord and membranes	44
763	Fetus or newborn affected by other complications of labor and delivery	1
764	Slow fetal growth and fetal malnutrition	1
765	Disorders relating to short gestation and unspecified low birthweight	154
767	Birth trauma	8
768	Intrauterine hypoxia and birth asphyxia	30
769	Respiratory distress syndrome	164
770	Other respiratory conditions of fetus and newborn	145
771	Infections specific to the perinatal period	35
772	Fetal and neonatal hemorrhage	9
773	Hemolytic disease of fetus or newborn, due to isoimmunization	2
774	Other perinatal jaundice	3
776	Hematological disorders of fetus and newborn	4
777	Perinatal disorders of digestive system	14
778	Conditions involving the integument and temperature regulation of fetus and newborn	7
779	Other and ill-defined conditions originating in the perinatal period	150
	XVI. SYMPTOMS, SIGNS AND ILL-DEFINED CONDITIONS (780-799)	
780	General symptoms	17
783	Symptoms concerning nutrition, metabolism and development	2
785	Symptoms involving cardiovascular system	22
786	Symptoms involving respiratory system and other chest symptoms	8
789	Other symptoms involving abdomen and pelvis	1
790	Nonspecific findings on examination of blood	2
793	Nonspecific abnormal findings on radiological and other examination of body structure	1
797	Senility without mention of psychosis	14
798	Sudden death, cause unknown	259
799	Other ill-defined and unknown causes of morbidity and mortality	93
	EXVII. EXTERNAL CAUSES OF INJURY AND POISONING (E800-E999)	
E805	Hit by rolling stock	6
E810	Motor vehicle traffic accident involving collision with train	26
E811	Motor vehicle traffic accident involving re-entrant collision with another motor vehicle	1
E812	Other motor vehicle traffic accident involving collision with another motor vehicle	47
E813	Motor vehicle traffic accident involving collision with other vehicle	47
E814	Motor vehicle traffic accident involving collision with pedestrian	243
E815	Other motor vehicle traffic accident involving collision on the highway	173
E816	Motor vehicle traffic accident due to loss of control, without collision on the highway	327
E818	Other noncollision motor vehicle traffic accident	39
E819	Motor vehicle traffic accident of unspecified nature	73
E820	Nontraffic accident involving motor-driven snow vehicle	7
E821	Nontraffic accident involving other off-road motor vehicle	9
E822	Other motor vehicle nontraffic accident involving collision with moving object	22
E823	Other motor vehicle nontraffic accident involving collision with stationary object	2
E825	Other motor vehicle nontraffic accident of other and unspecified nature	6
E826	Pedal cycle accident	3
E828	Accident involving animal being ridden	2
E830	Accident to watercraft causing submersion	16
E831	Accident to watercraft causing other injury	5
E832	Other accidental submersion or drowning in water transport accident	18
E838	Other and unspecified water transport accident	12
E840	Accident to powered aircraft at takeoff or landing	1
E841	Accident to powered aircraft, other and unspecified	39
E844	Other specified air transport accidents	1
E846	Accidents involving powered vehicles used solely within the buildings and	

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
	premises of an industrial or commercial establishment	1
E848	Accidents involving other vehicles not elsewhere classifiable	1
E850	Accidental poisoning by analgesics, antipyretics, antirheumatics	8
E852	Accidental poisoning by other sedatives and hypnotics	1
E853	Accidental poisoning by tranquillizers	4
E854	Accidental poisoning by other psychotropic agents	3
E855	Accidental poisoning by other drugs acting on central and autonomic nervous systems	17
E856	Accidental poisoning by antibiotics	2
E858	Accidental poisoning by other drugs	55
E860	Accidental poisoning by alcohol, not elsewhere classified	5
E862	Accidental poisoning by petroleum products, other solvents and their vapors, not elsewhere classified	1
E868	Accidental poisoning by other utility gas and other carbon monoxide	56
E869	Accidental poisoning by other gases and vapors	3
E870	Accidental cut, puncture, perforation or hemorrhage during medical care	3
E876	Other and unspecified misadventures during medical care	3
E878	Surgical operation and other surgical procedures as the cause of abnormal reaction of patient, or of later complication, without mention of misadventure	84
E879	Other procedures, without mention of misadventure at the time of procedure, as the cause of abnormal reaction of patient, or of later complication	16
E880	Fall on or from stairs or steps	62
E881	Fall on or from ladders or scaffolding	12
E882	Fall from or out of building or other structure	16
E883	Fall into hole or other opening in surface	4
E884	Other fall from one level to another	22
E885	Fall on same level from slipping, tripping or stumbling	5
E887	Fracture, cause unspecified	134
E888	Other and unspecified fall	151
E890	Conflagration in private dwelling	182
E891	Conflagration in other and unspecified building or structure	1
E893	Accident caused by ignition of clothing	6
E894	Ignition of highly inflammable material	2
E895	Accident caused by controlled fire in private dwelling	1
E898	Accident caused by other specified fire and flames	3
E899	Accident caused by unspecified fire	8
E900	Excessive heat	6
E901	Excessive cold	23
E902	High and low air pressure and changes in air pressure	1
E904	Hunger, thirst, exposure, neglect	13
E905	Venomous animals and plants as the cause of poisoning and toxic reactions	2
E906	Other injury caused by animals	4
E907	Lightning	2
E908	Cataclysmic storms, and floods resulting from storms	2
E910	Accidental drowning and submersion	122
E911	Inhalation and ingestion of food causing obstruction of respiratory tract or suffocation	55
E912	Inhalation and ingestion of other object causing obstruction of respiratory tract or suffocation	49
E913	Accidental mechanical suffocation	31
E915	Foreign body accidentally entering other orifice	2
E916	Struck accidentally by falling object	21
E917	Striking against or struck accidentally by objects or persons	1
E918	Caught accidentally in or between objects	3
E919	Accidents caused by machinery	29
E920	Accidents caused by cutting and piercing instruments or objects	2
E921	Accident caused by explosion of pressure vessel	1
E922	Accident caused by firearm missile	30
E923	Accident caused by explosive material	9
E924	Accident caused by hot substance or object, caustic or corrosive material and steam	8
E925	Accident caused by electric current	27

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1986 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
E927	Overexertion and strenuous movements	1
E928	Other and unspecified environmental and accidental causes	48
E929	Late effects of accidental injury	30
E936	Anticonvulsants and anti-Parkinsonism drugs	1
E938	Other central nervous system depressants	1
E947	Other and unspecified drugs and medicaments	6
E950	Suicide and selfinflicted poisoning by solid or liquid substances	106
E951	Suicide and selfinflicted poisoning by gases in domestic use	4
E952	Suicide and selfinflicted poisoning by other gases and vapors	171
E953	Suicide and selfinflicted injury by hanging, strangulation and suffocation	166
E954	Suicide and selfinflicted injury by submersion (drowning)	17
E955	Suicide and selfinflicted injury by firearms and explosives	604
E956	Suicide and selfinflicted injury by cutting and piercing instruments	19
E957	Suicide and selfinflicted injuries by jumping from high place	11
E958	Suicide and selfinflicted injury by other and unspecified means	19
E960	Fight, brawl, rape	3
E962	Assault by poisoning	1
E963	Assault by hanging and strangulation	36
E964	Assault by submersion [drowning]	1
E965	Assault by firearms and explosives	754
E966	Assault by cutting and piercing instrument	168
E967	Child battering and other maltreatment	12
E968	Assault by other and unspecified means	123
E969	Late effects of injury purposely inflicted by other person	5
E970	Injury due to legal intervention by firearms	12
E980	Poisoning by solid or liquid substances, undetermined whether accidentally or purposely inflicted	78
E982	Poisoning by other gases, undetermined whether accidentally or purposely inflicted	16
E983	Hanging, strangulation or suffocation, undetermined whether accidentally or purposely inflicted	3
E984	Submersion [drowning], undetermined whether accidentally or purposely inflicted	10 10
E985	Injury by firearms and explosives, undetermined whether accidentally or purposely inflicted	11
E986	Injury by cutting and piercing instruments, undetermined whether accidentally purposely inflicted	2
E987	Falling from high place, undetermined whether accidentally or purposely inflicted	2
E988	Injury by other and unspecified means, undetermined whether accidentally or purposely inflicted	16

Table 4.17
Population Changes by County, Michigan, 1976 and 1986

AREA	POPULATION ESTIMATE JULY 1, 1976	POPULATION ESTIMATE JULY 1, 1986	NET CHANGE	PERCENT CHANGE	NATURAL INCREASE	ESTIMATED NET MIGRATION
Michigan	9117539	9144545	27006	0.3	630022	-603016
Alcona	8983	10129	1146	11.3	-200	1346
Alger	9057	8601	-456	-5.3	340	-796
Allegan	75800	86617	10817	12.5	7086	3731
Alpena	32197	30878	-1319	-4.3	1858	-3177
Antrim	15538	16846	1308	7.8	573	735
Arenac	13496	15003	1507	10.0	631	876
Baraga	8204	8162	-42	-0.5	248	-290
Barry	42952	47800	4848	10.1	3281	1567
Bay	120563	114819	-5744	-5.0	8394	-14138
Benzie	10507	11262	755	6.7	362	393
Berrien	174881	163602	-11279	-6.9	11311	-22590
Branch	39445	39471	26	0.1	2556	-2530
Calhoun	142362	136887	-5475	-4.0	8478	-13953
Cass	47764	48450	686	1.4	2842	-2156
Charlevoix	18953	20216	1263	6.2	1359	-96
Cheboygan	19732	20733	1001	4.8	1014	-13
Chippewa	37173	29288	-7885	-26.9	1505	-9390
Clare	21821	24967	3146	12.6	726	2420
Clinton	53442	55744	2302	4.1	5176	-2874
Crawford	8807	10114	1307	12.9	716	591
Delta	39078	38649	-429	-1.1	2117	-2546
Dickinson	25085	26748	1663	6.2	681	982
Eaton	80081	91241	11160	12.2	6858	4302
Emmet	22005	24062	2057	8.5	1313	744
Genesee	444881	434874	-10007	-2.3	38371	-48378
Gladwin	17540	21564	4024	18.7	807	3217
Gogebic	21023	18770	-2253	-12.0	-534	-1719
Grand Traverse	47695	59192	11497	19.4	4557	6940
Gratiot	40044	39344	-700	-1.8	2417	-3117
Hillsdale	40788	42577	1789	4.2	2598	-809
Houghton	38682	37325	-1357	-3.6	620	-1977
Huron	36454	36562	108	0.3	1696	-1588
Ingham	267071	277806	10735	3.9	27597	-16862
Ionia	49303	53705	4402	8.2	4733	-331
Iosco	28118	30382	2264	7.5	2951	-687
Iron	14052	14034	-18	-0.1	-251	233
Isabella	51110	54156	3046	5.6	4081	-1035
Jackson	148501	144442	-4059	-2.8	8912	-12971
Kalamazoo	205924	217653	11729	5.4	16738	-5009
Kalkaska	10244	11922	1678	14.1	1102	576
Kent	423886	477507	53621	11.2	46826	6795

Table 4.17
Population Changes by County, Michigan, 1976 and 1986 (Cont.)

AREA	POPULATION ESTIMATE JULY 1, 1976	POPULATION ESTIMATE JULY 1, 1986	NET CHANGE	PERCENT CHANGE	NATURAL INCREASE	ESTIMATED NET MIGRATION
Keweenaw	2095	2039	-56	-2.7	-117	61
Lake	7183	8612	1429	16.6	-48	1477
Lapeer	62808	70353	7545	10.7	6256	1289
Leelanau	12948	14957	2009	13.4	676	1333
Lenawee	88393	88758	365	0.4	6556	-6191
Livingston	79826	104620	24794	23.7	8077	16717
Luce	7024	5880	-1144	-19.5	196	-1340
Mackinac	10292	10453	161	1.5	264	-103
Macomb	661732	697181	35449	5.1	45386	-9937
Manistee	22390	22206	-184	-0.8	264	-448
Marquette	71373	71342	-31	-0.0	7885	-7916
Mason	25176	26360	1184	4.5	1111	73
Mecosta	35029	38189	3160	8.3	2125	1035
Menominee	25289	25847	558	2.2	869	-311
Midland	69324	72400	3076	4.2	6923	-3847
Missaukee	8879	10960	2081	19.0	947	1134
Monroe	127150	131973	4823	3.7	10089	-5266
Montcalm	44905	50822	5917	11.6	3461	2456
Montmorency	6997	7929	932	11.8	92	840
Muskegon	157396	158545	1149	0.7	12002	-10853
Newaygo	32283	37663	5380	14.3	2393	2987
Oakland	962611	1025785	63174	6.2	66069	-2895
Oceana	21421	22656	1235	5.5	1647	-412
Ogemaw	14855	17409	2554	14.7	495	2059
Ontonagon	11448	8909	-2539	-28.5	25	-2564
Osceola	18168	20418	2250	11.0	1219	1031
Oscoda	5885	6928	1043	15.1	152	891
Otsego	13597	15803	2206	14.0	1259	947
Ottawa	142496	171274	28778	16.8	17148	11630
Presque Isle	14246	13922	-324	-2.3	552	-876
Roscommon	14790	18738	3948	21.1	-20	3968
Saginaw	226111	216392	-9719	-4.5	18904	-28623
St Clair	132928	140507	7579	5.4	8232	-653
St Joseph	53045	59587	6542	11.0	4257	2285
Sanilac	39695	40319	624	1.5	2088	-1464
Schoolcraft	8758	8330	-428	-5.1	205	-633
Shiawassee	68910	68962	52	0.1	6075	-6023
Tuscola	54319	55083	764	1.4	4163	-3399
Van Buren	63708	67346	3638	5.4	4644	-1006
Washtenaw	253925	265959	12034	4.5	24245	-12211
Wayne	2461656	2164319	-297337	-13.7	119345	-416682
Wexford	23233	26706	3473	13.0	1539	1934
County Not Stated	-	-	-	-	-74	74

Table 4.18
Population by Age, Race, and Sex, Michigan Residents, 1986

AGE IN YEARS	ALL RACES			WHITE			BLACK			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
UNDER 1	138384	70860	67524	113469	58191	55278	21925	11080	10845	2990	1589	1401
1-4	549118	281110	268008	450770	231333	219437	88762	44974	43788	9586	4803	4783
5-9	671990	344093	327897	548671	281899	266772	111867	56446	55421	11452	5748	5704
10-14	703815	360685	343130	572407	294549	277858	120392	60539	59853	11016	5597	5419
15-19	744941	379100	365841	615011	314265	300746	120155	59851	60304	9775	4984	4791
20-24	777010	386986	390024	653530	327757	325773	114245	54606	59639	9235	4623	4612
25-29	802358	396569	405789	681269	341159	340110	110558	50328	60230	10531	5082	5449
30-34	760793	375455	385338	647517	324296	323221	101063	45480	55583	12213	5679	6534
35-39	674219	330825	343394	579365	288174	291191	83682	37352	46330	11172	5299	5873
40-44	561141	274504	286637	487933	241193	246740	64889	29131	35758	8319	4180	4139
45-49	465359	226658	238701	407594	200393	207201	52067	23390	28677	5698	2875	2823
50-54	427336	206914	220422	374892	183429	191463	48381	21492	26889	4063	1993	2070
55-59	428639	206393	222246	377986	183251	194735	47508	21663	25845	3145	1479	1666
60-64	401705	189265	212440	356254	168296	187958	43030	19875	23155	2421	1094	1327
65-69	347352	156611	190741	309841	139907	169934	35599	15867	19732	1912	837	1075
70-74	271686	115737	155949	243598	103833	139765	26617	11248	15369	1471	656	815
75-79	193368	75917	117451	174481	68229	106252	17882	7255	10627	1005	433	572
80-84	121539	42715	78824	110650	38550	72100	10272	3922	6350	617	243	374
85+	103792	30510	73282	94805	27599	67206	8577	2826	5751	410	85	325
TOTAL	9144545	4450907	4693638	7800043	3816303	3983740	1227471	577325	650146	117031	57279	59752

Source: The estimate of the total state population was provided by the Department of Management and Budget, Office of Revenue and Tax Analysis. The breakdown of the total population by age, race, and sex was prepared by the Department of Public Health, Office of the State Registrar and Center for Health Statistics. See Technical Notes.

Table 4.19
Abridged Life Table, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.01131	100000.	1131.	99000.	7406634.	74.1
1-5	0.00202	98869.	199.	394993.	7307634.	73.9
5-10	0.00117	98670.	115.	493032.	6912641.	70.1
10-15	0.00147	98554.	144.	492486.	6419610.	65.1
15-20	0.00480	98410.	472.	490960.	5927123.	60.2
20-25	0.00579	97938.	566.	488299.	5436164.	55.5
25-30	0.00596	97372.	580.	485445.	4947865.	50.8
30-35	0.00755	96792.	730.	482208.	4462420.	46.1
35-40	0.00963	96062.	925.	478095.	3980212.	41.4
40-45	0.01252	95137.	1191.	472877.	3502117.	36.8
45-50	0.01838	93946.	1727.	465751.	3029241.	32.2
50-55	0.03036	92220.	2800.	454686.	2563490.	27.8
55-60	0.05079	89420.	4541.	436578.	2108804.	23.6
60-65	0.07995	84879.	6785.	408361.	1672226.	19.7
65-70	0.11533	78093.	9006.	368996.	1263865.	16.2
70-75	0.17077	69087.	11798.	316973.	894869.	13.0
75-80	0.24365	57289.	13958.	252312.	577897.	10.1
80-85	0.35656	43331.	15450.	177815.	325585.	7.5
85+	1.00000	27881.	27881.	147770.	147770.	5.3

[1] Definitions of life table values are contained in the Technical Notes

Table 4.20
Abridged Life Table for Males, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.01307	100000.	1307.	98842.	7074280.	70.7
1-5	0.00219	98693.	216.	394248.	6975438.	70.7
5-10	0.00127	98477.	124.	492042.	6581190.	66.8
10-15	0.00175	98352.	172.	491450.	6089148.	61.9
15-20	0.00699	98181.	686.	489331.	5597698.	57.0
20-25	0.00873	97495.	851.	485389.	5108367.	52.4
25-30	0.00904	96645.	874.	481073.	4622978.	47.8
30-35	0.01059	95771.	1014.	476399.	4141905.	43.2
35-40	0.01321	94757.	1251.	470754.	3665506.	38.7
40-45	0.01581	93506.	1478.	464017.	3194753.	34.2
45-50	0.02308	92028.	2123.	455240.	2730736.	29.7
50-55	0.03819	89905.	3433.	441683.	2275496.	25.3
55-60	0.06573	86472.	5683.	419143.	1833813.	21.2
60-65	0.10153	80788.	8202.	384468.	1414670.	17.5
65-70	0.14662	72586.	10642.	337525.	1030202.	11.2
70-75	0.22561	61943.	13975.	275663.	692677.	11.2
75-80	0.31020	47969.	14880.	202796.	417014.	8.7
80-85	0.44434	33089.	14703.	127802.	214218.	6.5
85+	1.00000	18386.	18386.	86416.	86416.	4.7

[1] Definitions of life table values are contained in the Technical Notes

Table 4.21
Abridged Life Table for Females, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.00946	100000.	946.	99165.	7739244.	77.4
1-5	0.00184	99054.	182.	395775.	7640079.	77.1
5-10	0.00107	98872.	105.	494070.	7244304.	73.3
10-15	0.00117	98767.	115.	493575.	6750234.	68.3
15-20	0.00253	98651.	249.	492669.	6256659.	63.4
20-25	0.00286	98402.	281.	491317.	5763990.	58.6
25-30	0.00293	98121.	287.	489923.	5272673.	53.7
30-35	0.00458	97834.	447.	488118.	4782750.	48.9
35-40	0.00618	97387.	601.	485528.	4294632.	44.1
40-45	0.00937	36786.	906.	481817.	3809105.	39.4
45-50	0.01391	95880.	1333.	476330.	3327287.	34.7
50-55	0.02297	94547.	2171.	467736.	2850957.	30.2
55-60	0.03672	92376.	3392.	454067.	2383221.	25.8
60-65	0.06032	88984.	5367.	432347.	1929154.	21.7
65-70	0.08888	83618.	7432.	400420.	1496808.	17.9
70-75	0.12784	76186.	9739.	357769.	1096388.	14.4
75-80	0.19759	66447.	13129.	300761.	738619.	11.1
80-85	0.30412	53318.	16215.	226372.	437858.	8.2
85+	1.00000	37103.	37103.	211486.	211486.	5.7

[1] Definitions of life table values are contained in the Technical Notes

Table 4.22
Abridged Life Table for Whites, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.00881	100000.	881.	99228.	7511330.	75.1
1-5	0.00183	99119.	181.	396027.	7412102.	74.8
5-10	0.00097	98938.	96.	494425.	7016075.	70.9
10-15	0.00134	98842.	132.	493949.	6521650.	66.0
15-20	0.00431	98710.	425.	492561.	6027701.	61.1
20-25	0.00498	98285.	489.	490210.	5535140.	56.3
25-30	0.00484	97796.	473.	487808.	5044930.	51.6
30-35	0.00561	97323.	546.	485295.	4557122.	46.8
35-40	0.00709	96777.	686.	482262.	4071828.	42.1
40-45	0.01026	96091.	985.	478166.	3589565.	37.4
45-50	0.01592	95106.	1514.	472059.	3111400.	32.7
50-55	0.02660	93592.	2489.	462315.	2639340.	28.2
55-60	0.04698	91103.	4279.	445669.	2177026.	23.9
60-65	0.07574	86824.	6576.	418635.	1731357.	19.9
65-70	0.11044	80248.	8862.	380211.	1312722.	16.4
70-75	0.16782	71386.	11980.	328107.	932511.	13.1
75-80	0.24030	59406.	14275.	262195.	604404.	10.2
80-85	0.35617	45131.	16074.	185300.	342208.	7.6
85+	1.00000	29057.	29057.	156909.	156909.	5.4

[1] Definitions of life table values are contained in the Technical Notes

Table 4.23
Abridged Life Table for White Males, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.01035	100000.	1035.	99094.	7193880.	71.9
1-5	0.00196	98965.	193.	395388.	7094786.	71.7
5-10	0.00109	98772.	107.	493566.	6699398.	67.8
10-15	0.00158	98665.	156.	493040.	6205832.	62.9
15-20	0.00613	98509.	603.	491155.	5712792.	58.0
20-25	0.00727	97906.	712.	487774.	5221637.	53.3
25-30	0.00731	97195.	710.	484209.	4733863.	48.7
30-35	0.00795	96485.	766.	480548.	4249654.	44.0
35-40	0.00942	95718.	901.	476429.	37[illegible]106.	39.4
40-45	0.01266	94817.	1200.	471284.	3292677.	34.7
45-50	0.01979	93617.	1852.	463844.	2821394.	30.1
50-55	0.03341	91765.	3066.	451902.	2357550.	25.7
55-60	0.06103	88699.	5413.	430999.	1905647.	21.5
60-65	0.09646	83286.	8034.	397434.	1474649.	17.7
65-70	0.14133	75253.	10635.	350991.	1077214.	14.3
70-75	0.22203	64618.	14347.	288232.	726223.	11.2
75-80	0.30799	50271.	15483.	212883.	437991.	8.7
80-85	0.44491	34788.	15477.	134348.	225108.	6.5
85+	1.00000	19311.	19311.	90760.	90760.	4.7

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.24
Abridged Life Table for White Females, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.00720	100000.	720.	99370.	7821010.	78.2
1-5	0.00170	99280.	168.	396699.	7721640.	77.8
5-10	0.00085	99112.	84.	495329.	7324941.	73.9
10-15	0.00108	99028.	107.	494907.	6829611.	69.0
15-20	0.00241	98921.	238.	494044.	6334705.	64.0
20-25	0.00267	98683.	263.	492757.	5840661.	59.2
25-30	0.00235	98420.	231.	491534.	5347904.	54.3
30-35	0.00326	98189.	320.	490193.	4856370.	49.5
35-40	0.00479	97869.	468.	488268.	4366177.	44.6
40-45	0.00790	97401.	769.	485230.	3877909.	39.8
45-50	0.01217	96632.	1176.	480459.	3392679.	35.1
50-55	0.02003	95456.	1912.	472911.	2912221.	30.5
55-60	0.03358	93544.	3141.	460542.	2439309.	26.1
60-65	0.05682	90404.	5136.	440020.	1978767.	21.9
65-70	0.08428	85267.	7186.	409341.	1538747.	18.0
70-75	0.12538	78082.	9789.	367194.	1129405.	14.5
75-80	0.19374	68292.	13230.	309831.	762212.	11.2
80-85	0.30383	55062.	16729.	233884.	452381.	8.2
85+	1.00000	38333.	38333.	218496.	218496.	5.7

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.25
Abridged Life Table for Blacks, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.02522	100000.	2522.	97730.	6736318.	67.4
1-5	0.00315	97478.	307.	389203.	6638588.	68.1
5-10	0.00219	97171.	213.	485270.	6249385.	64.3
10-15	0.00212	96958.	205.	484386.	5764116.	59.4
15-20	0.00755	96753.	730.	482111.	5279729.	54.6
20-25	0.01072	96023.	1029.	477651.	4797616.	50.0
25-30	0.01317	94994.	1251.	472022.	4319967.	45.5
30-35	0.02010	93743.	1884.	464276.	3847945.	41.0
35-40	0.02765	91860.	2540.	453119.	3383668.	36.8
40-45	0.03014	89320.	2692.	440020.	2930549.	32.8
45-50	0.03755	86628.	3252.	425490.	2490529.	28.7
50-55	0.05995	83376.	4998.	405051.	2065039.	24.8
55-60	0.08240	78378.	6458.	376434.	1659988.	21.2
60-65	0.11555	71920.	8310.	339595.	1283554.	17.8
65-70	0.15976	63610.	10162.	293155.	943959.	14.8
70-75	0.20151	53448.	10770.	240695.	650803.	12.2
75-80	0.28112	42678.	11997.	183524.	410108.	9.6
80-85	0.37133	30680.	11392.	124360.	226584.	7.4
85+	1.00000	19288.	19288.	102225.	102225.	5.3

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.26
Abridged Life Table for Black Males, Michigan Residents, 1986

Age	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.02861	100000.	2861.	97411.	6270045.	62.7
1-5	0.00356	97139.	345.	387735.	6172634.	63.5
5-10	0.00222	96794.	214.	483382.	5784899.	59.8
10-15	0.00265	96580.	255.	482457.	5301517.	54.9
15-20	0.01189	96325.	1145.	479065.	4819060.	50.0
20-25	0.01789	95180.	1702.	471826.	4339995.	45.6
25-30	0.02144	93478.	2004.	462593.	3868169.	41.4
30-35	0.02971	91474.	2717.	450958.	3405576.	37.2
35-40	0.04299	88758.	3815.	434437.	2954619.	33.3
40-45	0.04251	84943.	3611.	415761.	2520182.	29.7
45-50	0.05131	81332.	4173.	396736.	2104421.	25.9
50-55	0.07839	77159.	6048.	371398.	1707685.	22.1
55-60	0.10745	71111.	7641.	337107.	1336287.	18.8
60-65	0.14476	63470.	9188.	295006.	999180.	15.7
65-70	0.19595	54282.	10637.	245307.	704174.	13.0
70-75	0.26401	43646.	11523.	189484.	458867.	10.5
75-80	0.34034	32123.	10932.	132856.	269383.	8.4
80-85	0.44677	21191.	9467.	81426.	136526.	6.4
85+	1.00000	11723.	11723.	55100.	55100.	4.7

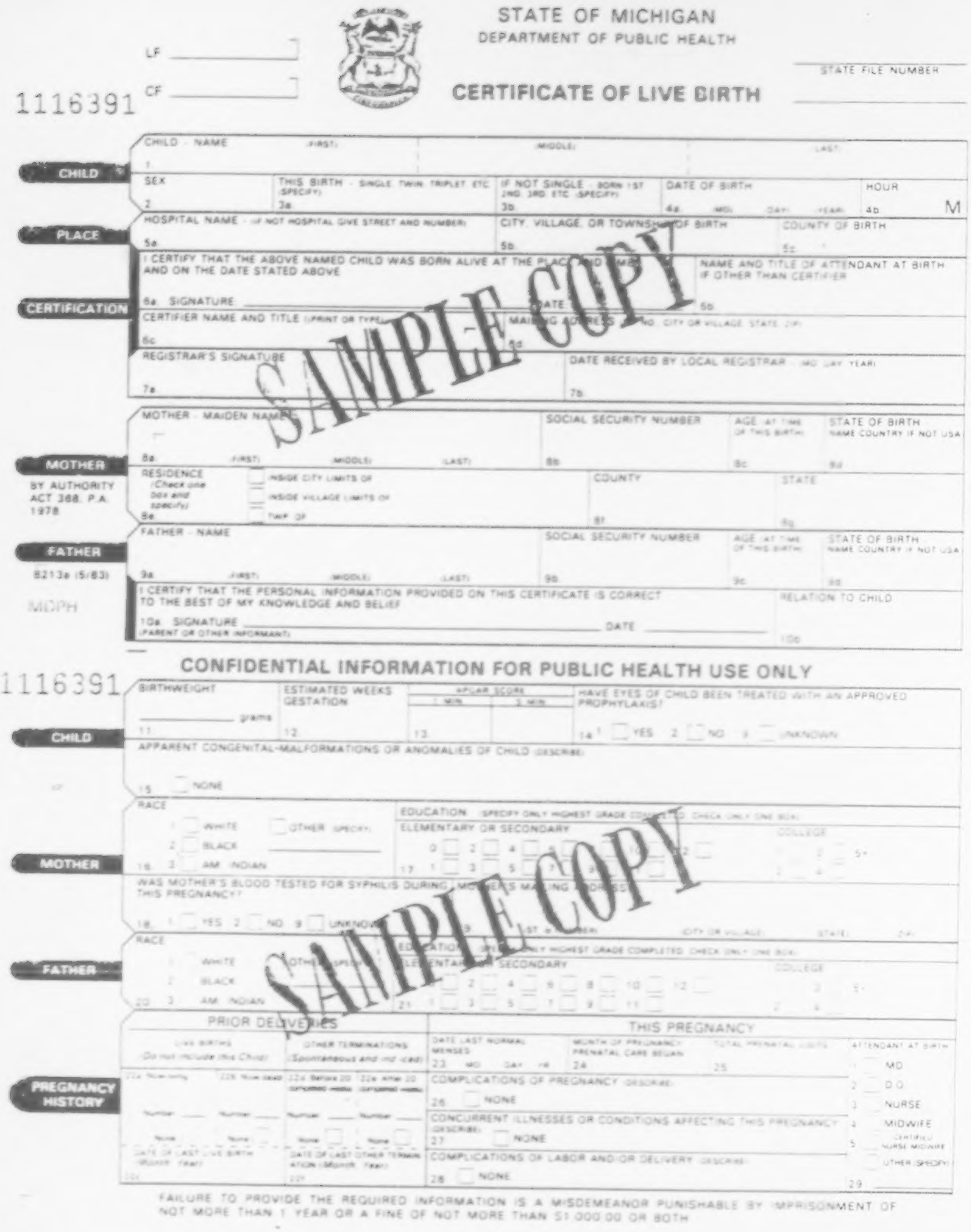
[1] Definitions of life table values are contained in the Technical Notes

Table 4.27
Abridged Life Table for Black Females, Michigan Residents, 1986

Age	nqx(1)[1]	1x(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.02176	100000.	2176.	98056.	7202991.	72.0
1-5	0.00274	97824.	268.	390703.	7104935.	72.6
5-10	0.00217	97556.	211.	487201.	6714232.	68.8
10-15	0.00159	97345.	154.	486362.	6227031.	64.0
15-20	0.00323	97191.	314.	485220.	5740669.	59.1
20-25	0.00411	96877.	397.	483452.	5255449.	54.2
25-30	0.00621	96480.	599.	481062.	4771998.	49.5
30-35	0.01217	95881.	1166.	476661.	4290936.	44.8
35-40	0.01511	94714.	1431.	470140.	3814274.	40.3
40-45	0.01995	93284.	1860.	461968.	3344134.	35.8
45-50	0.02619	91423.	2394.	451579.	2882166.	31.5
50-55	0.04496	89030.	4003.	435722.	2430587.	27.3
55-60	0.06088	85027.	5176.	412856.	1994865.	23.5
60-65	0.08972	79852.	7164.	382231.	1582010.	19.8
65-70	0.12959	72687.	9419.	340408.	1199778.	16.5
70-75	0.15271	63268.	9662.	292879.	859370.	13.6
75-80	0.23784	53606.	12750.	236871.	566491.	10.6
80-85	0.32028	40857.	13085.	171323.	329620.	8.1
85+	1.00000	27771.	27771.	158297.	158297.	5.7

[1] Definitions of life table values are contained in the Technical Notes.

FIGURE 4.3



STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH

LF ____________
CF ____________
1116391

CERTIFICATE OF LIVE BIRTH

STATE FILE NUMBER ____________

SAMPLE COPY

CHILD
CHILD - NAME (FIRST) (MIDDLE) (LAST) 1
SEX 2 | THIS BIRTH - SINGLE, TWIN, TRIPLET, ETC. (SPECIFY) 3a | IF NOT SINGLE - BORN 1ST, 2ND, 3RD, ETC. (SPECIFY) 3b | DATE OF BIRTH 4a (MO) (DAY) (YEAR) | HOUR 4b M

PLACE
HOSPITAL NAME - (IF NOT HOSPITAL GIVE STREET AND NUMBER) 5a | CITY, VILLAGE, OR TOWNSHIP OF BIRTH 5b | COUNTY OF BIRTH 5c

CERTIFICATION
I CERTIFY THAT THE ABOVE NAMED CHILD WAS BORN ALIVE AT THE PLACE AND TIME AND ON THE DATE STATED ABOVE
6a. SIGNATURE ____________ DATE ____
NAME AND TITLE OF ATTENDANT AT BIRTH IF OTHER THAN CERTIFIER 6b
CERTIFIER NAME AND TITLE (PRINT OR TYPE) 6c | MAILING ADDRESS (ST. NO., CITY OR VILLAGE, STATE, ZIP) 6d
REGISTRAR'S SIGNATUBE 7a | DATE RECEIVED BY LOCAL REGISTRAR (MO. DAY, YEAR) 7b

MOTHER
BY AUTHORITY ACT 368, P.A. 1978
MOTHER - MAIDEN NAME 8a (FIRST) (MIDDLE) (LAST) | SOCIAL SECURITY NUMBER 8b | AGE (AT TIME OF THIS BIRTH) 8c | STATE OF BIRTH (NAME COUNTRY IF NOT USA) 8d
RESIDENCE (Check one box and specify) 8e ☐ INSIDE CITY LIMITS OF ☐ INSIDE VILLAGE LIMITS OF ☐ TWP. OF | COUNTY 8f | STATE 8g

FATHER
8213a (5/83)
MDPH
FATHER - NAME 9a (FIRST) (MIDDLE) (LAST) | SOCIAL SECURITY NUMBER 9b | AGE (AT TIME OF THIS BIRTH) 9c | STATE OF BIRTH (NAME COUNTRY IF NOT USA) 9d
I CERTIFY THAT THE PERSONAL INFORMATION PROVIDED ON THIS CERTIFICATE IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF
10a. SIGNATURE (PARENT OR OTHER INFORMANT) ____________ DATE ____________
RELATION TO CHILD 10b

CONFIDENTIAL INFORMATION FOR PUBLIC HEALTH USE ONLY

1116391

CHILD
BIRTHWEIGHT ________ grams 11 | ESTIMATED WEEKS GESTATION 12 | APGAR SCORE 1 MIN. 5 MIN. 13 | HAVE EYES OF CHILD BEEN TREATED WITH AN APPROVED PROPHYLAXIS? 14 1 ☐ YES 2 ☐ NO 9 ☐ UNKNOWN
APPARENT CONGENITAL-MALFORMATIONS OR ANOMALIES OF CHILD (DESCRIBE) 15 ☐ NONE

MOTHER
RACE 16 1 ☐ WHITE 2 ☐ BLACK 3 ☐ AM. INDIAN ☐ OTHER (SPECIFY) ________
EDUCATION (SPECIFY ONLY HIGHEST GRADE COMPLETED. CHECK ONLY ONE BOX) ELEMENTARY OR SECONDARY 17 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ COLLEGE 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5+ ☐
WAS MOTHER'S BLOOD TESTED FOR SYPHILIS DURING THIS PREGNANCY? 18 1 ☐ YES 2 ☐ NO 9 ☐ UNKNOWN
MOTHER'S MAILING ADDRESS 19 (ST. & NUMBER) (CITY OR VILLAGE) (STATE) (ZIP)

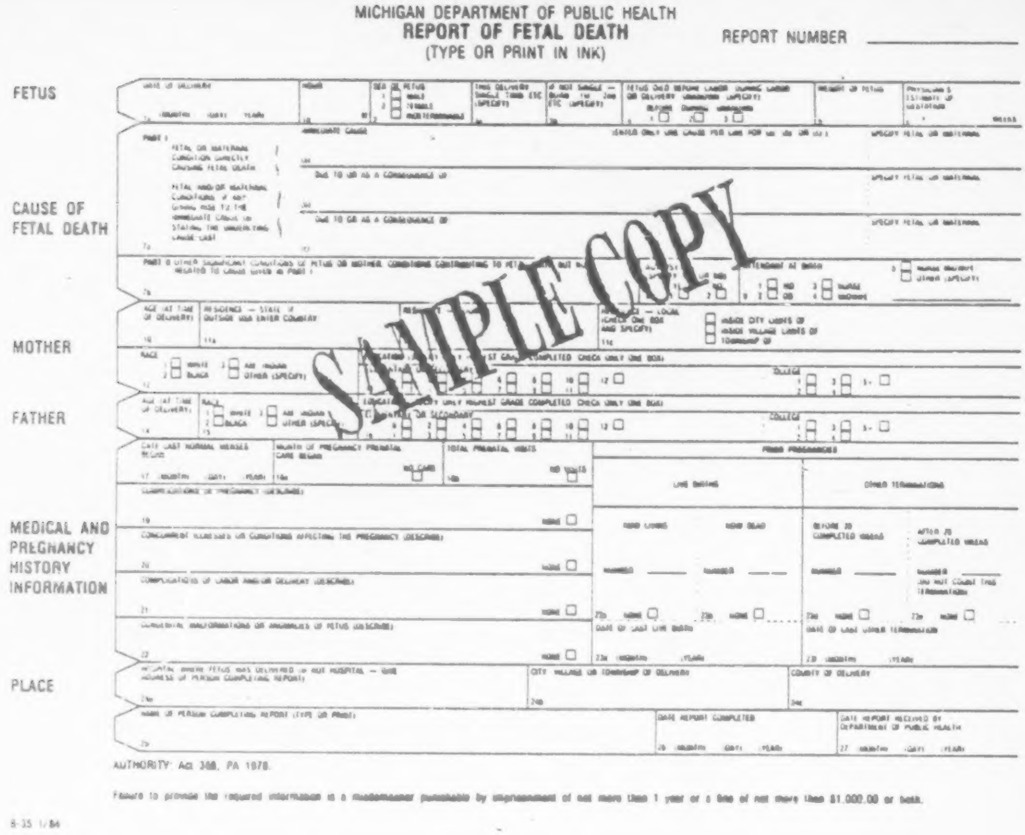
FATHER
RACE 20 1 ☐ WHITE 2 ☐ BLACK 3 ☐ AM. INDIAN ☐ OTHER (SPECIFY)
EDUCATION (SPECIFY ONLY HIGHEST GRADE COMPLETED. CHECK ONLY ONE BOX) ELEMENTARY OR SECONDARY 21 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ COLLEGE 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5+ ☐

PREGNANCY HISTORY
PRIOR DELIVERIES
LIVE BIRTHS (Do not include this Child) 22a. Now living Number ____ ☐ None 22b. Now dead Number ____ ☐ None
OTHER TERMINATIONS (Spontaneous and induced) 22c. Before 20 completed weeks Number ____ ☐ None 22d. After 20 completed weeks Number ____ ☐ None
DATE OF LAST LIVE BIRTH (Month, Year) 22e
DATE OF LAST OTHER TERMINATION (Month, Year) 22f
THIS PREGNANCY
DATE LAST NORMAL MENSES 23 MO. DAY YR. | MONTH OF PREGNANCY PRENATAL CARE BEGAN 24 | TOTAL PRENATAL VISITS 25
COMPLICATIONS OF PREGNANCY (DESCRIBE) 26 ☐ NONE
CONCURRENT ILLNESSES OR CONDITIONS AFFECTING THIS PREGNANCY (DESCRIBE) 27 ☐ NONE
COMPLICATIONS OF LABOR AND/OR DELIVERY (DESCRIBE) 28 ☐ NONE
ATTENDANT AT BIRTH 29 1 ☐ MD 2 ☐ D.O. 3 ☐ NURSE 4 ☐ MIDWIFE 5 ☐ CERTIFIED NURSE MIDWIFE ☐ OTHER (SPECIFY) ________

FAILURE TO PROVIDE THE REQUIRED INFORMATION IS A MISDEMEANOR PUNISHABLE BY IMPRISONMENT OF NOT MORE THAN 1 YEAR OR A FINE OF NOT MORE THAN $1,000.00 OR BOTH

SAMPLE COPY

FIGURE 4.4



MICHIGAN DEPARTMENT OF PUBLIC HEALTH
REPORT OF FETAL DEATH
(TYPE OR PRINT IN INK)

REPORT NUMBER ______

FETUS

CAUSE OF FETAL DEATH

MOTHER

FATHER

MEDICAL AND PREGNANCY HISTORY INFORMATION

PLACE

SAMPLE COPY

AUTHORITY: Act 368, PA 1978.

Failure to provide the required information is a misdemeanor punishable by imprisonment of not more than 1 year or a fine of not more than $1,000.00 or both.

B-35 1/84

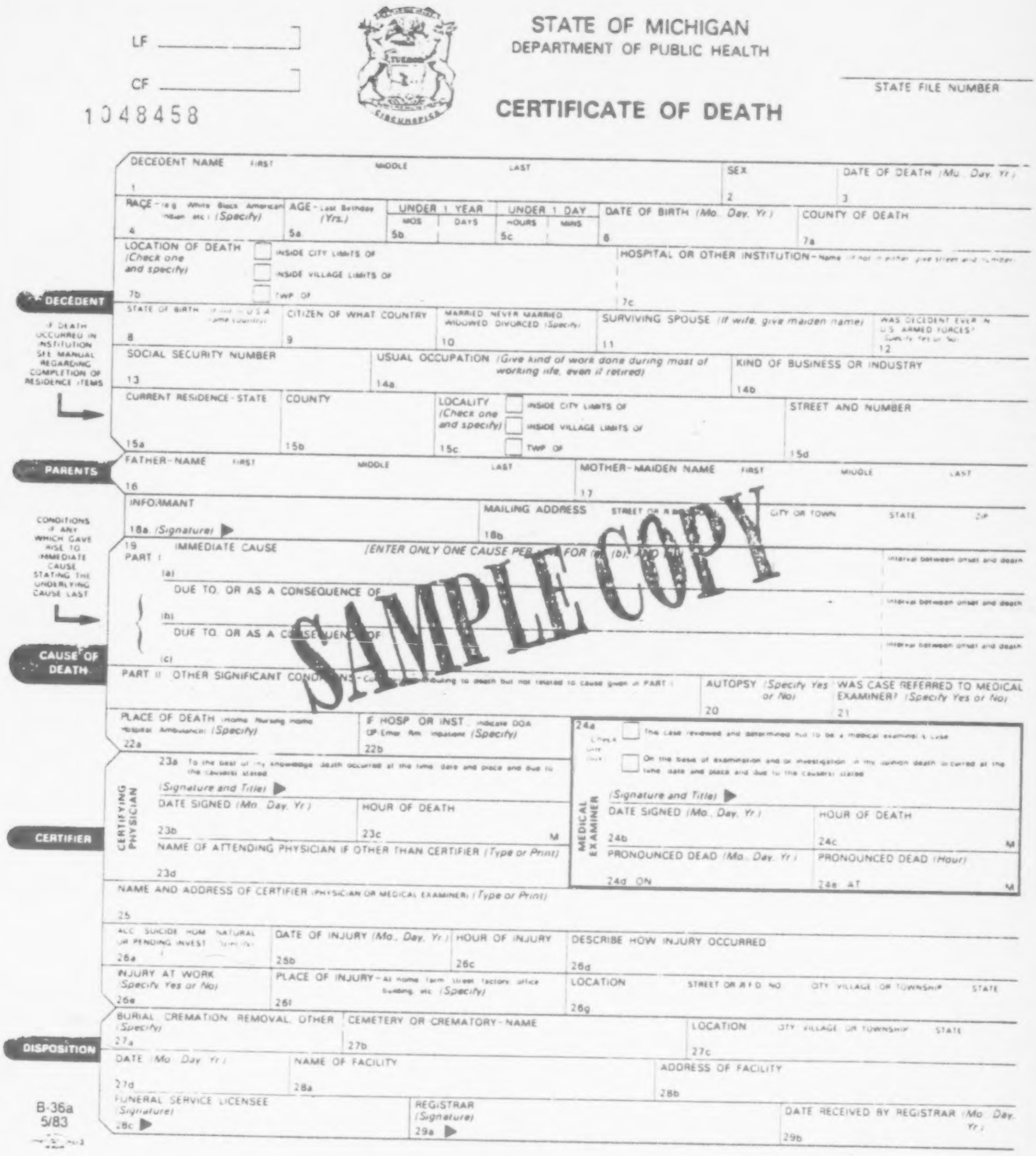
INSTRUCTIONS

Michigan Public Act 368 of 1978 requires the reporting of the death of a fetus which has completed 20 weeks of gestation or weighs at least 400 grams to the state registrar within 5 days after delivery. Responsibility for filing fetal death reports lies with the following: 1) the institution where the fetus is delivered; 2) the attending physician if delivered outside an institution; 3) the medical examiner, when investigation by the medical examiner is required.

As these reports are necessary in the development of important statistical health measures for the state, including fetal and perinatal mortality, and the analysis of various variables associated to fetal death outcomes, it is important that each report be as accurrate and complete as is possible.

DO NOT REPORT THE NAME OF THE BIOLOGICAL PARENTS, OR OTHER INFORMATION WHICH WOULD MAKE IT POSSIBLE TO IDENTIFY EITHER PARENT.

FIGURE 4.5



LF ________
CF ________
1048458

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH

CERTIFICATE OF DEATH

STATE FILE NUMBER

DECEDENT

DECEDENT NAME FIRST MIDDLE LAST 1
SEX 2
DATE OF DEATH (Mo., Day, Yr.) 3
RACE – (e.g. White, Black, American Indian, etc.) (Specify) 4
AGE – Last Birthday (Yrs.) 5a
UNDER 1 YEAR MOS DAYS 5b
UNDER 1 DAY HOURS MINS 5c
DATE OF BIRTH (Mo., Day, Yr.) 6
COUNTY OF DEATH 7a
LOCATION OF DEATH (Check one and specify) ☐ INSIDE CITY LIMITS OF ☐ INSIDE VILLAGE LIMITS OF ☐ TWP. OF 7b
HOSPITAL OR OTHER INSTITUTION – Name (If not in either, give street and number) 7c
STATE OF BIRTH (If not in U.S.A., name country) 8
CITIZEN OF WHAT COUNTRY 9
MARRIED, NEVER MARRIED, WIDOWED, DIVORCED (Specify) 10
SURVIVING SPOUSE (If wife, give maiden name) 11
WAS DECEDENT EVER IN U.S. ARMED FORCES? (Specify Yes or No) 12
SOCIAL SECURITY NUMBER 13
USUAL OCCUPATION (Give kind of work done during most of working life, even if retired) 14a
KIND OF BUSINESS OR INDUSTRY 14b

IF DEATH OCCURRED IN INSTITUTION SEE MANUAL REGARDING COMPLETION OF RESIDENCE ITEMS

CURRENT RESIDENCE – STATE 15a
COUNTY 15b
LOCALITY (Check one and specify) ☐ INSIDE CITY LIMITS OF ☐ INSIDE VILLAGE LIMITS OF ☐ TWP. OF 15c
STREET AND NUMBER 15d

PARENTS

FATHER – NAME FIRST MIDDLE LAST 16
MOTHER – MAIDEN NAME FIRST MIDDLE LAST 17
INFORMANT 18a. (Signature) ▶
MAILING ADDRESS STREET OR R[illegible] CITY OR TOWN STATE ZIP 18b

CAUSE OF DEATH

CONDITIONS, IF ANY, WHICH GAVE RISE TO IMMEDIATE CAUSE, STATING THE UNDERLYING CAUSE LAST

19 PART I IMMEDIATE CAUSE [ENTER ONLY ONE CAUSE PER [illegible] FOR (a), (b), AND [illegible]
(a) Interval between onset and death
DUE TO, OR AS A CONSEQUENCE OF
(b) Interval between onset and death
DUE TO, OR AS A CONSEQUENCE OF
(c) Interval between onset and death
PART II OTHER SIGNIFICANT CON[illegible]NS – Co[illegible]buting to death but not related to cause given in PART I
AUTOPSY (Specify Yes or No) 20
WAS CASE REFERRED TO MEDICAL EXAMINER? (Specify Yes or No) 21

SAMPLE COPY

CERTIFIER

PLACE OF DEATH (Home, Nursing home, Hospital, Ambulance) (Specify) 22a
IF HOSP. OR INST., indicate DOA, OP/Emer. Rm., Inpatient (Specify) 22b

CERTIFYING PHYSICIAN
23a To the best of my knowledge, death occurred at the time, date and place and due to the cause(s) stated.
(Signature and Title) ▶
DATE SIGNED (Mo., Day, Yr.) 23b
HOUR OF DEATH 23c M
NAME OF ATTENDING PHYSICIAN IF OTHER THAN CERTIFIER (Type or Print) 23d

MEDICAL EXAMINER
24a Check one only
☐ The case reviewed and determined not to be a medical examiner's case
☐ On the basis of examination and/or investigation, in my opinion death occurred at the time, date and place and due to the cause(s) stated.
(Signature and Title) ▶
DATE SIGNED (Mo., Day, Yr.) 24b
HOUR OF DEATH 24c M
PRONOUNCED DEAD (Mo., Day, Yr.) 24d ON
PRONOUNCED DEAD (Hour) 24e AT M

NAME AND ADDRESS OF CERTIFIER (PHYSICIAN OR MEDICAL EXAMINER) (Type or Print) 25
ACC., SUICIDE, HOM., NATURAL OR PENDING INVEST. (Specify) 26a
DATE OF INJURY (Mo., Day, Yr.) 26b
HOUR OF INJURY 26c
DESCRIBE HOW INJURY OCCURRED 26d
INJURY AT WORK (Specify Yes or No) 26e
PLACE OF INJURY – At home, farm, street, factory, office building, etc. (Specify) 26f
LOCATION STREET OR R.F.D. NO. CITY, VILLAGE, OR TOWNSHIP STATE 26g

DISPOSITION

BURIAL, CREMATION, REMOVAL, OTHER (Specify) 27a
CEMETERY OR CREMATORY – NAME 27b
LOCATION CITY, VILLAGE, OR TOWNSHIP STATE 27c
DATE (Mo., Day, Yr.) 27d
NAME OF FACILITY 28a
ADDRESS OF FACILITY 28b
FUNERAL SERVICE LICENSEE (Signature) 28c ▶
REGISTRAR (Signature) 29a ▶
DATE RECEIVED BY REGISTRAR (Mo., Day, Yr.) 29b

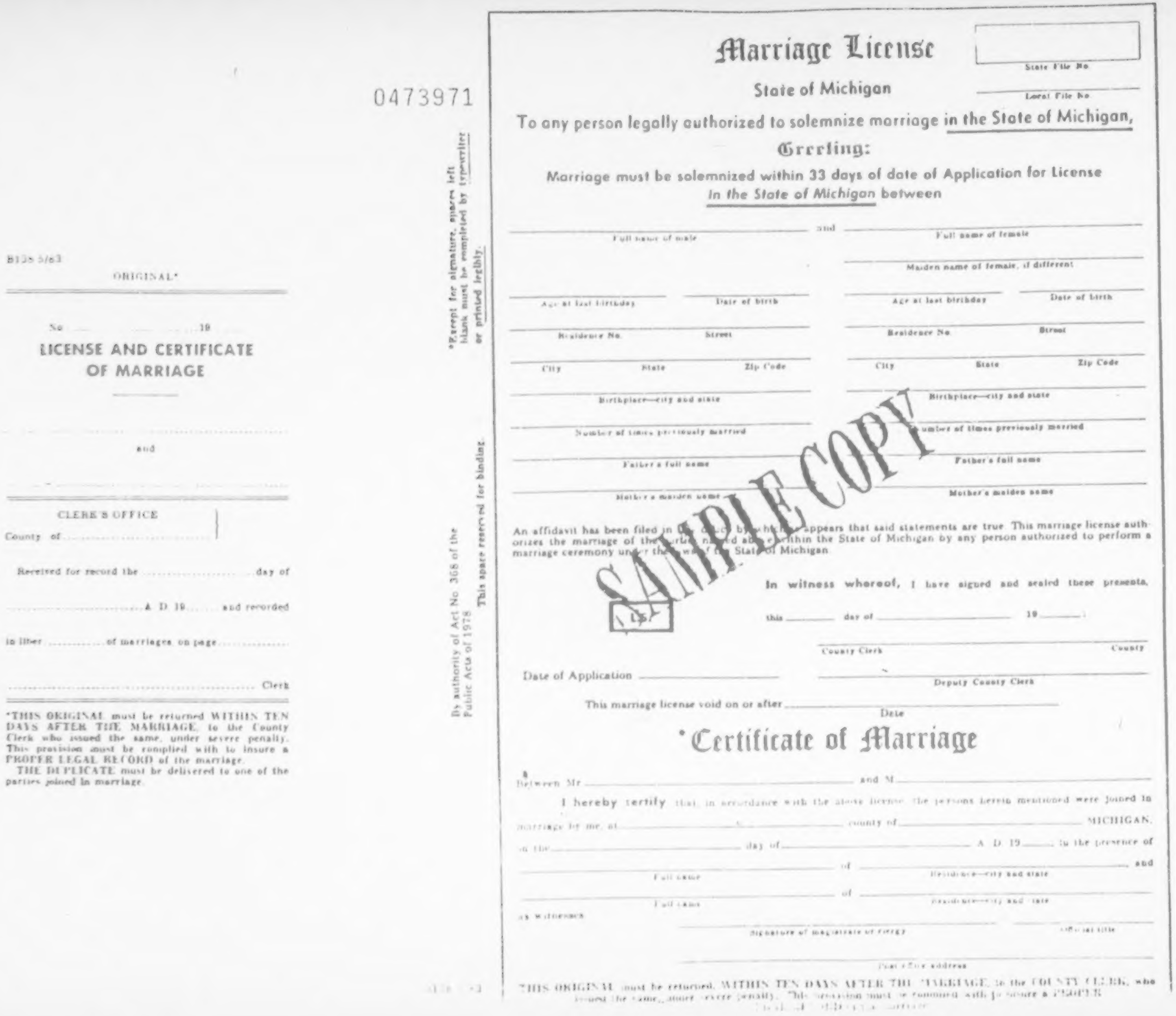
B-36a
5/83

Section 2843 of Act 368 Public Acts of 1978, requires that the attending physician, or in the absence of an attending physician, a medical examiner shall fill out and sign the medical certificate of death within 48 hours after death.

The funeral director is responsible for completing all other portions of the certificate and obtaining a burial or removal permit prior to disposing of the body or removing from the registration district where the death occurred.

This document must be typewritten (except signatures) or completed in black indelible ink. Alterations to the document must be accomplished using a lift off process. Damaged or folded documents are not acceptable.

Failure to provide the required information is a misdemeanor punishable by imprisonment of not more than 1 year or a fine of not more than $1,000.00 or both.



0473971

B138 5/63

ORIGINAL*

No .... 19 ......

LICENSE AND CERTIFICATE OF MARRIAGE

....

and

....

CLERK'S OFFICE

County of ....

Received for record the .... day of

.... A. D. 19 .... and recorded

in liber .... of marriages on page ....

.... Clerk

*THIS ORIGINAL must be returned WITHIN TEN DAYS AFTER THE MARRIAGE, to the County Clerk who issued the same, under severe penalty. This provision must be complied with to insure a PROPER LEGAL RECORD of the marriage.

THE DUPLICATE must be delivered to one of the parties joined in marriage.

By authority of Act No. 368 of the Public Acts of 1978

This space reserved for binding.

*Except for signature, spaces left blank must be completed by typewriter or printed legibly.

Marriage License

State of Michigan

State File No. ____________

Local File No. ____________

To any person legally authorized to solemnize marriage in the State of Michigan,

Greeting:

Marriage must be solemnized within 33 days of date of Application for License In the State of Michigan between

Full name of male	and	Full name of female
		Maiden name of female, if different
Age at last birthday / Date of birth		Age at last birthday / Date of birth
Residence No. / Street		Residence No. / Street
City / State / Zip Code		City / State / Zip Code
Birthplace—city and state		Birthplace—city and state
Number of times previously married		Number of times previously married
Father's full name		Father's full name
Mother's maiden name		Mother's maiden name

SAMPLE COPY

An affidavit has been filed in the office by which it appears that said statements are true. This marriage license authorizes the marriage of the parties named above within the State of Michigan by any person authorized to perform a marriage ceremony under the laws of the State of Michigan.

In witness whereof, I have signed and sealed these presents,

this ________ day of ____________________ 19 ______.

L.S.

____________________ County Clerk ____________________ County

Date of Application ____________________

____________________ Deputy County Clerk

This marriage license void on or after ____________________ Date

*Certificate of Marriage

Between Mr. ____________________ and M ____________________

I hereby certify that, in accordance with the above license, the persons herein mentioned were joined in marriage by me, at ____________________, county of ____________________, MICHIGAN,

on the ____________________ day of ____________________ A. D. 19 ______, in the presence of

____________________ Full name of ____________________ Residence—city and state and

____________________ Full name of ____________________ Residence—city and state

as witnesses

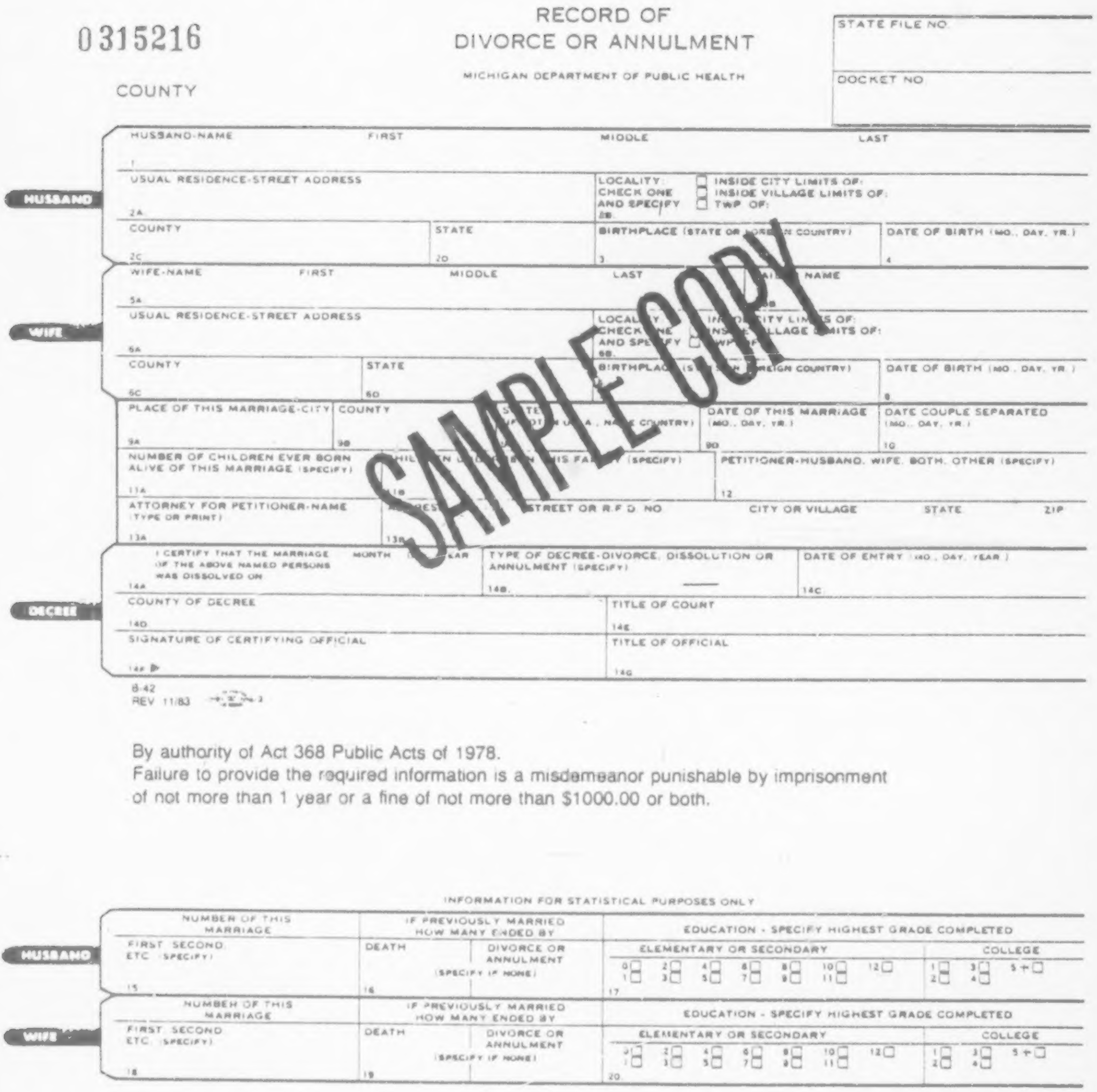
____________________ Signature of magistrate or clergy ____________________ Official title

____________________ Post office address

THIS ORIGINAL must be returned WITHIN TEN DAYS AFTER THE MARRIAGE, to the COUNTY CLERK, who issued the same, under severe penalty. This provision must be complied with to insure a PROPER LEGAL RECORD of the marriage.

FIGURE 4.6

FIGURE 4.7



0315216

COUNTY

RECORD OF
DIVORCE OR ANNULMENT

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

STATE FILE NO.

DOCKET NO.

SAMPLE COPY

HUSBAND

HUSBAND-NAME FIRST MIDDLE LAST 1

USUAL RESIDENCE-STREET ADDRESS 2A

LOCALITY: CHECK ONE AND SPECIFY 2B ☐ INSIDE CITY LIMITS OF: ☐ INSIDE VILLAGE LIMITS OF: ☐ TWP. OF:

COUNTY 2C

STATE 2D

BIRTHPLACE (STATE OR FOREIGN COUNTRY) 3

DATE OF BIRTH (MO., DAY, YR.) 4

WIFE

WIFE-NAME FIRST MIDDLE LAST 5A

MAIDEN NAME 5B

USUAL RESIDENCE-STREET ADDRESS 6A

LOCALITY: CHECK ONE AND SPECIFY 6B ☐ INSIDE CITY LIMITS OF: ☐ INSIDE VILLAGE LIMITS OF: ☐ TWP. OF:

COUNTY 6C

STATE 6D

BIRTHPLACE (STATE OR FOREIGN COUNTRY) 7

DATE OF BIRTH (MO., DAY, YR.) 8

PLACE OF THIS MARRIAGE-CITY 9A

COUNTY 9B

STATE (IF NOT IN U.S.A., NAME COUNTRY) 9C

DATE OF THIS MARRIAGE (MO., DAY, YR.) 9D

DATE COUPLE SEPARATED (MO., DAY, YR.) 10

NUMBER OF CHILDREN EVER BORN ALIVE OF THIS MARRIAGE (SPECIFY) 11A

CHILDREN UNDER 18 IN THIS FAMILY (SPECIFY) 11B

PETITIONER-HUSBAND, WIFE, BOTH, OTHER (SPECIFY) 12

ATTORNEY FOR PETITIONER-NAME (TYPE OR PRINT) 13A

ADDRESS STREET OR R.F.D. NO. CITY OR VILLAGE STATE ZIP 13B

DECREE

I CERTIFY THAT THE MARRIAGE OF THE ABOVE NAMED PERSONS WAS DISSOLVED ON 14A MONTH DAY YEAR

TYPE OF DECREE-DIVORCE, DISSOLUTION OR ANNULMENT (SPECIFY) 14B

DATE OF ENTRY (MO., DAY, YEAR) 14C

COUNTY OF DECREE 14D

TITLE OF COURT 14E

SIGNATURE OF CERTIFYING OFFICIAL 14F ▶

TITLE OF OFFICIAL 14G

B-42
REV 11/83

By authority of Act 368 Public Acts of 1978.
Failure to provide the required information is a misdemeanor punishable by imprisonment of not more than 1 year or a fine of not more than $1000.00 or both.

INFORMATION FOR STATISTICAL PURPOSES ONLY

HUSBAND

NUMBER OF THIS MARRIAGE — FIRST, SECOND, ETC. (SPECIFY) 15

IF PREVIOUSLY MARRIED HOW MANY ENDED BY — DEATH 16 — DIVORCE OR ANNULMENT (SPECIFY IF NONE)

EDUCATION - SPECIFY HIGHEST GRADE COMPLETED 17
ELEMENTARY OR SECONDARY: 0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐
COLLEGE: 1☐ 2☐ 3☐ 4☐ 5+☐

WIFE

NUMBER OF THIS MARRIAGE — FIRST, SECOND, ETC. (SPECIFY) 18

IF PREVIOUSLY MARRIED HOW MANY ENDED BY — DEATH 19 — DIVORCE OR ANNULMENT (SPECIFY IF NONE)

EDUCATION - SPECIFY HIGHEST GRADE COMPLETED 20
ELEMENTARY OR SECONDARY: 0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐
COLLEGE: 1☐ 2☐ 3☐ 4☐ 5+☐